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What Coal Miners Earn, See Page 880

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COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, *Editor*

Volume 24 NEW YORK, DECEMBER 13, 1923 Number 24

The President on Coal

PRESIDENT COOLIDGE did much with coal in four short paragraphs in his first message to Congress. He took a strong position in favor of private management and against government ownership or operation. But private owners, he points out, must recognize the paramount public interest in their business and conduct themselves accordingly. He puts it up to the industry to correct its abuses. He urges as of exceeding importance legislation giving the chief executive wide power over coal in times of national emergency. He strikes a popular chord when he says the cost of coal is "unbearably high," but unless he was saying that wages behind that cost are too high, he was not thinking of bituminous coal. We can see nothing in his message to indicate that the administration sees coal as a subject of major political importance. Congress, and certainly Pinchot, so see it, but the urge, it seems, will not come from the White House.

Without giving a blanket endorsement to the recommendations of the Coal Commission, the President singles out several on which to put his stamp of approval. He leaves to Congress the details with no citation of urgency on any save that of giving the President emergency power. His last words deserve special note: "Those who undertake the responsibility of management or employment in this industry do so with the full knowledge that the public interest is paramount, and that to fail through any motive of selfishness in its service is such a betrayal of duty as warrants uncompromising action by the government."

The Inarticulate Public

MEETINGS convened to discuss coal take on some of the attributes of the attractions at county fairs. The same bunch of side shows, the same merry-go-rounds, the same games of chance move from fair to fair. At the coal meetings the erstwhile Coal Commission, the Geological Survey, the Department of Commerce, and the Federal Trade Commission always are represented. Among the observers at each meeting will be found familiar faces of representatives of the Bituminous Operators' Special Committee, of the trade press, of the anthracite operators and of the United Mine Workers of America.

While this situation brings out joking remarks on the part of those who attend many of these gatherings, they are not losing sight of the fact that these assemblages are significant of the activities in connection with the building up of a public opinion in respect to coal. There are many evidences that the public is becoming better acquainted with that commodity. Debating societies throughout the country are finding coal a fertile field for such discussion. Some student in each university in the country has chosen coal as the subject of his doctor of philosophy thesis. The newspapers are showing an increased understanding of the fundamentals in the industry. Three years ago it was necessary to put "overdevelopment" in quotation marks and explain what was meant. Today the man in the street is acquainted with a large amount of detail as to the conduct of the coal industry. Progress is slow but it is moving, unquestionably, in the direction of an informed public opinion.

Officials around the Interstate Commerce Commission, for instance, are inclined to attach significance to the fact that the public is not interested greatly in coal because few witnesses appeared at the hearings at which the reasonableness of anthracite freight rates were being considered. They are overlooking the fact that the individual is not prepared to make the financial sacrifice necessary to prepare an argument and present it at such a hearing. If he did go the railroad lawyers would entangle him. The individual consumer of coal is very much concerned in the treatment he is receiving from the industry. These individuals are not organized and have difficulty in obtaining even local or neighborhood co-operation. Nevertheless in the aggregate they constitute a force capable of shackling any industry. The hope of the industry lies in the acquainting of those consumers with an accurate knowledge of the business so that they may not support unsound policies purported to be in their behalf.

Earnings

IT HAS long been the theory that wage rates as between anthracite and bituminous coal should be so pegged that the longer working year of the hard-coal worker would give the same annual earning power as the shorter year in soft coal. That is, anthracite rates have for years been lower than in the union bituminous-coal region. It is now possible to obtain a reliable check on how this theory has worked out, for with the interpretation of the Coal Commission's earnings studies, as published in this issue, we have comparable figures of annual earnings for the major classifications of coal-mine workers.

Contract miners in the anthracite mines in 1921—a normal year—averaged 250 days' work and earned $1,922 on the average. In the soft-coal regions in 1921—a year of little work—the union tonnage men, including machine men, loaders and pick miners, averaged 134 days and $1,034, compared with 151 days and $1,051 at the non-union mines. Even in 1920—a year of high production—the soft-coal tonnage men, who worked an average of 220 days and earned between $1,750 and $1,800 on the average, fell behind the hard-coal contract miners. Governor Pinchot last September gave the anthracite tonnage men an increase of 10 per

cent over these figures, thus bringing their average to nearly $2,200 per year, some $400 per year above the general average for the soft-coal tonnage men in a good year. With this increase the *average* contract miner in the anthracite region has a higher earning by some $200 than the *full-time* tonnage worker in soft coal. Before the recent 10-per cent advance the average daily earning of the anthracite contract men was approximately the same as that of tonnage workers in the bituminous-coal mines.

It is on this accounting that the union will base whatever demands it may make next spring for an increase in wages for the soft-coal miners. It is this advantage possessed by the anthracite tonnage men before Pinchot interjected his 10-per cent increase that gives significance to the gratuitous boost of last September. The soft-coal tonnage workers are still further behind. What is more natural than that they will want to overtake the worker in the anthracite region?

Looking at the day worker, we find the opposite picture. Here the earnings of the hard-coal inside man are from $1.75 to $2.25 per day less than in the bituminous-coal regions. The hard-coal day worker in anthracite averaged $1,480 in 1921, against $1,293 in the union and $1,125 in the non-union soft-coal mines, but compared with $1,600 in 1920, a year of better working time. Full-time workers paid by the day inside the soft-coal mines earned $1,850 in 1920 and between $1,510 and $1,600 in 1921. Likewise the outside day men around the bituminous-coal mines, with earnings of from $1,700 to $1,875 in 1920, are better off than the same class of workers at the anthracite mines, who with the 10-per cent increase will average about $1,450.

It were much better that the coal industry correct such irregularities in rates as may have brought about these variations in earning power by peaceful discussion, by that process which the United Mine Workers hug so closely, in name at least, collective bargaining, than that they resort to the strike.

The mine workers alone are organized to give constructive direction to the correction of existing scales. Is the problem too large even for them?

More or Less Domestic Coke

ANTHRACITE finds one of its chief competitors in various kinds of coke—gas or byproduct coke—and may later find it in coke prepared by the low-temperature distillation process. Judging by what has been written and by what some have feared, the anthracite industry has before it some extremely formidable competition, and that without at all belittling the effect of coke on the volume of present-day sales of anthracite.

However, a significant, if somewhat feeble, department of the American Gas Association is the "Complete Gasification of Coal" Section. At the convention of the association in 1921 President Monroe said: "Some of you gentlemen are going to be able to give us a gas from raw coal of 420 B.t.u., and we are going to have no byproducts to handle or sell; nothing but ashes to take away. When you give that to us (and you are going to give it to us within the next five years) the problem of the owner of a gas property will be much simpler than it is today, for now when he makes coal gas he is left with an enormous quantity of coke as residue, which puts him into a business which takes a far larger annual turnover than his mere gas production."

Unfortunately, according to L. P. Willien, even using oxygen 90 per cent pure he cannot make a gas by complete gasification of his coal that will meet the requirements of the consumer, and such gas would need enrichment with oil. However, the proposition is brought measurably near by the use of oxygen instead of air, and the process of making oxygen is now so cheap that the use of an inferior oxygen looks not entirely impossible. Nevertheless to bring the gas thus made to 500 or 550 B.t.u. would require 2 to 2.75 gallons of gas oil per thousand cubic feet.

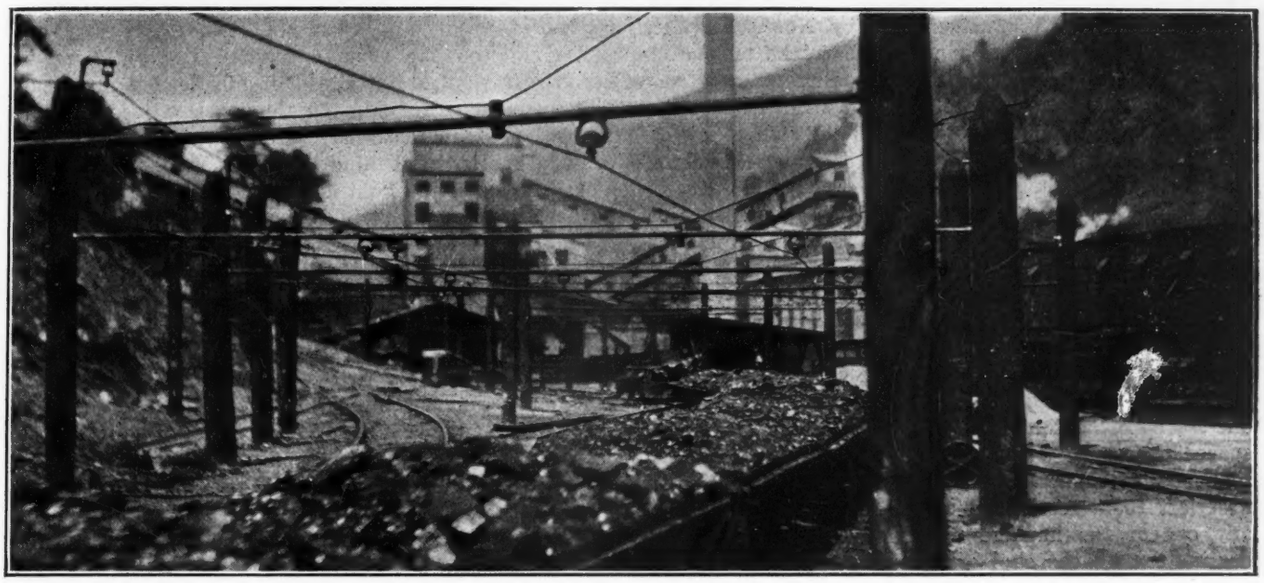
Apparently the prospect of making a commercial product with the aid of a little oil or with a somewhat lower standard of thermal value in gas is not so far distant as to make it unworthy of consideration. The coal probably would be first carbonized, then gasified by combustion in the presence of steam and oxygen. Either oil gas will be added or else the coal gas will be sold without enrichment.

In any event only ashes will remain and the position of anthracite will be improved by the removal of coke from the domestic field. To show how oil gas is improved by the use of oxygen of the purity mentioned, gas prepared by the use of air and the Dayton process had 60 per cent of nitrogen and a thermal value of 500 B.t.u. per thousand cubic feet, whereas when prepared by the same process with oxygen 90 per cent pure the nitrogen fell to 4 per cent and the thermal value rose to 1,210 B.t.u.

AS A RESULT of government operation the coal production of Russia has fallen to 72 tons per man per year. To get the tonnage of 1918 with such inefficient operation the United States would need 9,400,000 men. If all the coal-mine workers in the United States were to combine their efforts to getting out anthracite and were to be no better skilled at doing so than the Russian employees of the coal mines we would get less than 50 per cent of a normal year's production of anthracite —no bituminous coal whatsoever. The Russian workmen under their benign government produce one ton of coal every four days. If the United States mines were run like those in Russia and had a production of coal equal to that reached in this country in 1910 it would be necessary for one man in four to be engaged in producing coal. All this is based on information afforded by the Soviet Government.

"BROTHER CHARLEY" BRYAN, Governor of Nebraska, now modestly offers himself for the Presidency, with "soft coal 25 per cent cheaper at the mines" as one of his planks. If he could run a mine so as to do that, five thousand bituminous-coal operators out of a total of five thousand, looking back over the past six months, would like to hire "Brother Charley" to operate their business for them. Possibly he has in mind inviting the country's householders to go down and pick loose their winter's supply. It is fortunate that political gas isn't blackdamp.

EVEN THOUGH HENRY AND EDSEL have gone into coal mining, National Coal Association statistics show there are fewer Fords in coal camps than ever before.



*Loaded Cars Approaching Dumphouse**

Biggest Problem at Lynch Is Haulage of Coal; How Its Large Output Moves to the Tipple

Haulage as Well as Extraction Needs Considered in Planning Layout of Producing Sections of Mine—Standardizing Output Units—Mules and Ponies Used—Grades Too Steep for Battery and Reel Locomotives

THE importance of the Lynch system of haulage is such as to warrant its having first place in any description of that operation. Main headings—by that is meant headings from which the mine areas and their headings are laid off—are being extended not necessarily to pierce the center of the property or to run parallel to either of its gravimetric axes but rather so as to facilitate haulage and to equalize production over the life of the mine, the property being subdivided in a manner that will provide mine areas giving approximately equal tonnage. For this reason we do not find in the Lynch mines on each side one main heading over which all coal comes but rather main headings off main headings, and from these are driven the customary haulageways and room sections which tap the mine areas.

Principal headings are driven as straight as an arrow. In a distance as much as two miles the center line of these principal headings converge or diverge no more than a fraction of an inch. Because of this accuracy in giving sights for projections, a transit set in the mouth of No. 30 mine would cut every spad in a single sight were it not for the varying gradients and the inability of the eye to penetrate that distance.

In the principal haulage roads top is brushed and bottom is lifted to produce a gradient usually of no more than 1¾ per cent in favor of the loads. Room headings are graded from haulageway to haulageway successively, as is to be expected, because the coal which lies between consecutive haulageways is mined out in about two years and the locomotive cannot pick up a full trip from the necks of the rooms lying in the intervening distance.

To simplify matters, I have chosen to describe only the system of haulage in No. 30 mine, which corresponds with that employed in No. 31 mine. By referring to the map of the mine on page 999 it will be seen that the greatest development is in two areas off No. 1 haulage right, which roadway has been driven to its western extremity. Most of the coal to the north or right of this heading has been mined.

No. 7 flat left, which is the barrier heading for the double mine area shown, is one of the main haulage arteries. No. 7 flat left and No. 1 haulage right each is provided with an empty and a loaded track. The development along the main heading is not as great as it is along No. 1 haulage right and consequently one track in it serves for both loads and empties.

The Lynch system of haulage owes its success to a minimizing of interference between trips of loads and of empties. This is obtained not entirely by resorting to individual tracks for travel in opposing directions but by routing and scheduling all trips so that they will be where the others are not, so far as is possible. Further refinement in haulage is obtained by the observance of rules laid down by the management. Thus at crossovers a loaded trip has the right-of-way. Trips on down gradient are given the same preference by trips traveling on the level or on an upgrade. All this applies to main haulage roads.

Wherever possible haulage is directed in loops. The best illustration of this is the route of trips traveling

*Headpiece shows loaded trip coming from No. 30 mine. The mine cars filled with coal go through the rotary dumps and are discharged. They then run to a track and are made up into a trip by a mechanical trip maker and dropped by gravity to the storage track beyond.

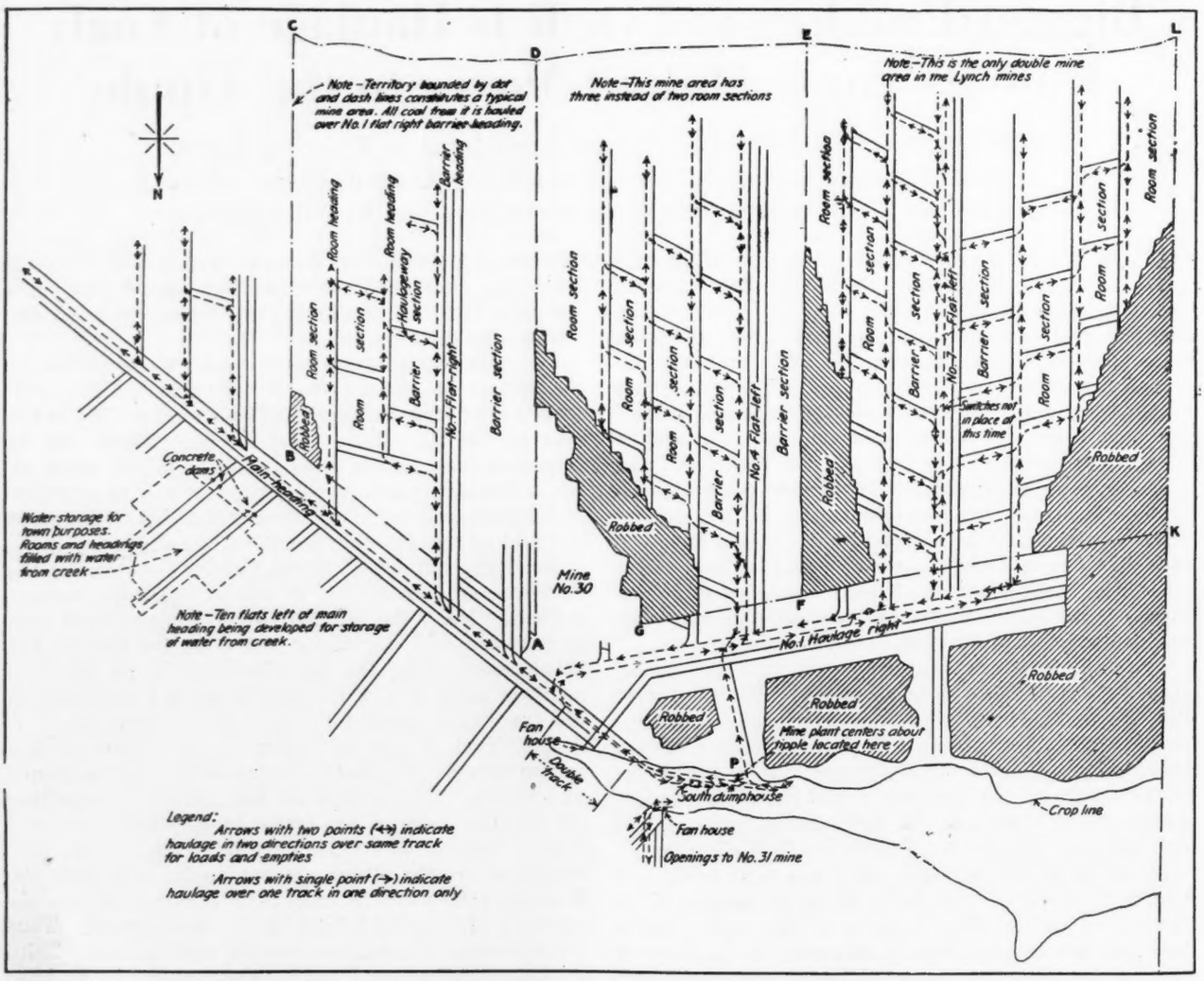
back and forth from the tipple to the double mine area pierced from No. 1 haulage right by No. 7 flat left, as indicated in the mine plan. Two tracks on one of the haulage entries of the main heading extend from the pit mouth for a distance of about 1,200 ft. into the mountain and then each turns into its own entry on No. 1 haulage right and continues a little beyond the last haulageway which connects with room headings.

Loaded trips on their way from this double mine area and the adjacent single-area travel over this course. Empty trips may travel this course also, but a more direct route is provided by an entry driven into the mountain at the point marked *P*. The alternative course for empty trips first mentioned is taken only in the event of a tie-up on the more direct route.

Main haulage roads in barrier headings connect with one-track roads in room headings by haulageways spaced on centers of about 700 ft. A trip of empties to be delivered, let us say, to working places in the first left room section off No. 7 flat left can turn on any one of the haulageways left so as to reach its destination by the shortest possible route. Naturally a desire is felt to keep a trip on the main haulage roads as much as is feasible, for these are laid with heavy steel and are better graded than the secondary haulage roads.

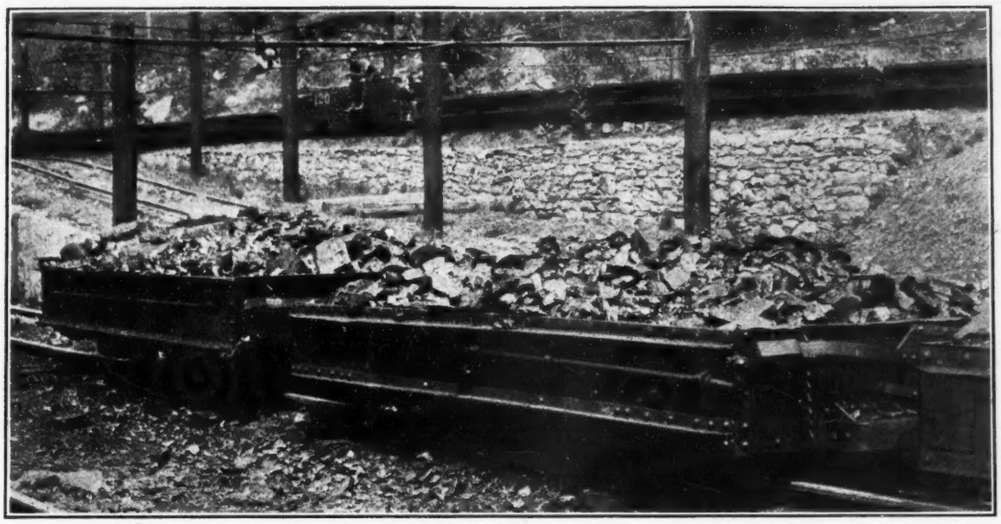
Arriving on the room entry the motorman moves his trip inby, pushing ahead of him loaded mine cars already waiting for him on the track adjacent to the rooms from which they have been drawn and simultaneously dropping off behind him as many empties as he picks up loads in front of him. In this way, after he has dropped off all his empties behind him, he has a full trip of loads in front of him and he is pointed outby for a return to the tipple. He travels the nearest haulageway to the main haulage road and proceeds in the customary manner to the outside. There he drops his trip of loads, runs around the dumphouse and picks up a trip which is ready for him.

Room sections are mined throughout advancing. Consequently in maneuvering in the extremity of a room section which is nearest the goaf, he may be required to back up his empties to bring out the loads which stand between the goaf and the first open haulageway and to back switch the loads into this haulageway, letting them stand until such time as is best to pull them. He then disposes of the remainder of his empties and picks up loads on the free track as before.


Note—Territory bounded by dot and dash lines constitutes a typical mine area. All coal from it is hauled over No. 1 flat right barrier heading.
Note—This mine area has three instead of two room sections
Note—This is the only double mine area in the Lynch mines
Room heading
Barrier heading
Haulageway section
Room section
Barrier section
No. 1 Flat right
No. 4 Flat left
No. 7 Flat left
Robbed
Switches not in place at this time
Concrete dams
Rain heading
Water storage for town purposes. Rooms and headings filled with water from creek
Note—Ten flats left of main heading being developed for storage of water from creek.
Mine No. 30
No. 1 Haulage right
Fan house
Double track
Mine plant centers about tipple located here
South dumphouse
Crop line
Openings to No. 31 mine
Legend:
Arrows with two points (↔) indicate haulage in two directions over same track for loads and empties
Arrows with single point (→) indicate haulage over one track in one direction only

GRAPHIC ILLUSTRATION OF METHOD OF MINING AND HAULAGE SYSTEM AT LYNCH MINES

Solid lines represent entries on which track has not been laid or those from which track has been removed on the retreat. Airways also are represented by solid lines. The drawing is not intended to indicate every feature of the mine system. Crosscuts, rooms and pillars are not shown.



Standard and Trial Car

The standard car is the one to the right. As an experiment the shorter, higher car on the left was built at Lynch, the journals being provided with vertical springs to make the car less rigid when passing over low places in the track. The standard car, however, gave better service.

Empties to the rooms driven to the right of No. 7 flat left are delivered through the first room heading on that side directly from No. 1 haulage right. But loads coming from this side are directed toward and over No. 7 flat left. After this room heading is closed by the encroachment of the robbed area upon the barrier section, empties will travel over the route taken by the loads. Then switches will be laid to connect the empty track of No. 7 flat left with haulageways right. These switches are shown in place but in reality they have not yet been laid, as the loop now used makes them unnecessary.

Trips are handled in somewhat the same manner in typical single mine areas as in the double mine area just described. Single mine areas are shown by *ABCD* and *AFED* in the mine plan. In these mine areas rooms are located on one side only, so that two tracks in the main headings of these areas are not needed, at least for the present. Loads and empties travel over one track throughout these mine areas.

One Track Will Serve for 1,000 Tons Daily

A production of about 1,000 tons per day from one mine area can be handled over one track in the main heading of that mine area. For a much greater tonnage in a mine area, as in the double-mine area, individual tracks for loads and empties become necessary. Also two tracks will be requisite in the main heading of a mine area producing 1,000 tons of coal per day when the live workings of that mine section move so far inby as to require the services of more locomotives. This must be recognized, for the mine areas are to be worked to the boundaries for distances of three miles or more.

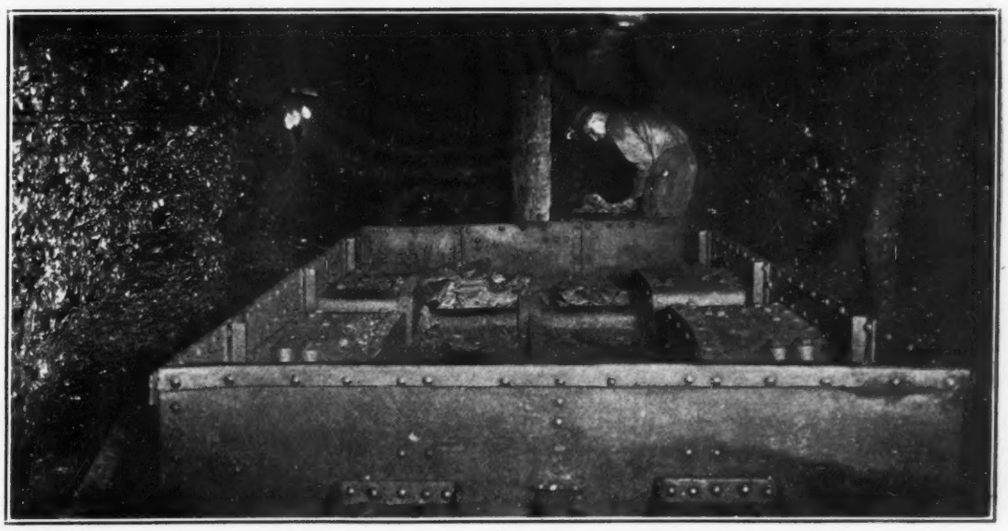
A single-mine area, which is the one commonly used in the Lynch mines, is preferable to the double-mine area for the reason that it can be ventilated with only one overcast. Where the air splits to the right and left, as it inevitably must in the double area, in accordance with the system of ventilation at Lynch, an overcast is required at every haulageway that crosses the return airways. The general paths of ventilation are such that the air is forced to the advanced workings first and is then made to sweep the goaf line outby.

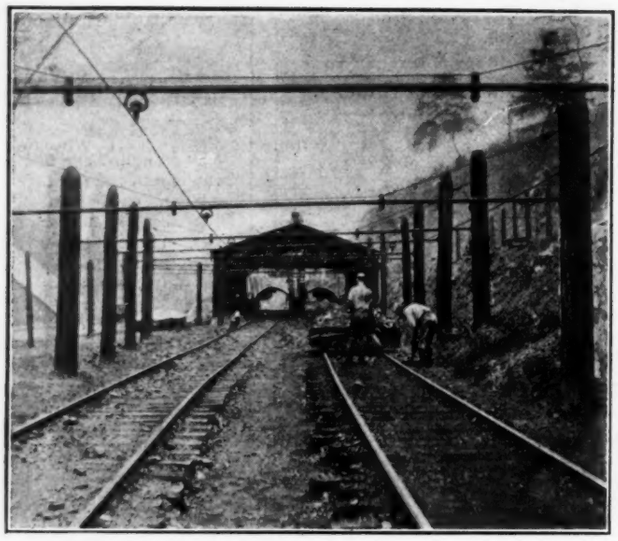
For gathering loads and distributing empties in room headings and for tramming to and from the tipple twenty-five 13-ton trolley locomotives are provided. During the month of May, 1923, the average daily output for each was 250 tons. The production per day has not yet reached the combined capacity of these locomotives.

Seeing that haulage roads cannot be graded everywhere to favor the loads owing to the rolls in the floor of the Lynch mines, the average daily output during the month of May per locomotive is substantial enough. Especially is this true because these locomotives must

Loading Mine Car in Heading

The top of the car 22 in. above the rail. The body is built so that the bottom is below the axles, the wheels being covered by steel plates. The reader will note the prop always in position in the center of the roadway and the three electric lights on the side of the road.





TRACK LEADING TO DUMPHOUSE, NO. 31 MINE

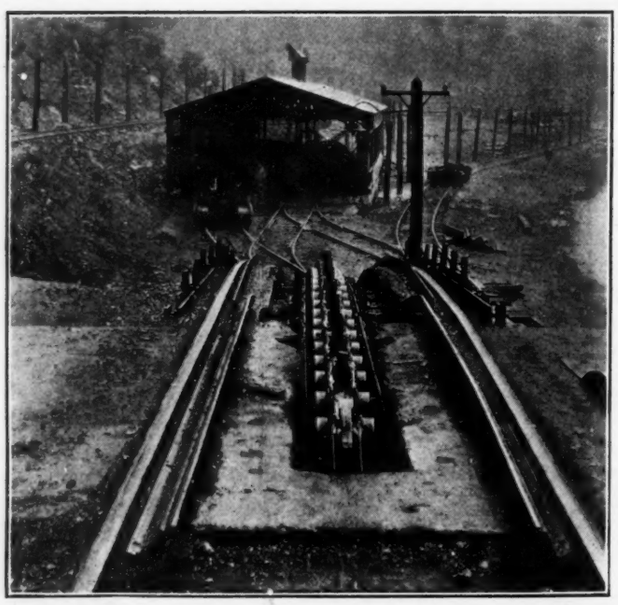
Rotary dump can be seen opposite each track. Roads are periodically cleaned and fishplates tightened.

gather from in front of the room necks and also tram the loads to the tipple.

In a time study the average time of all locomotives in seven mine areas for making a round trip was determined as 81 minutes. When hauling trips of 20 mine cars an average of at least six round trips can be made by each locomotive, allowing ample time for delays.

Do Not Permit Locomotive to Be Overloaded

As a general rule no single trip is allowed to have more than 25 mine cars. For long hauls as many as 30 mine cars sometimes are permitted. The company has learned that on short hauls more coal can be pulled by a given number of locomotives when the trips are small and made frequently than can be hauled in trips of maximum size which are continually stalling. Fewer mine cars are needed, for fewer are in transit than is



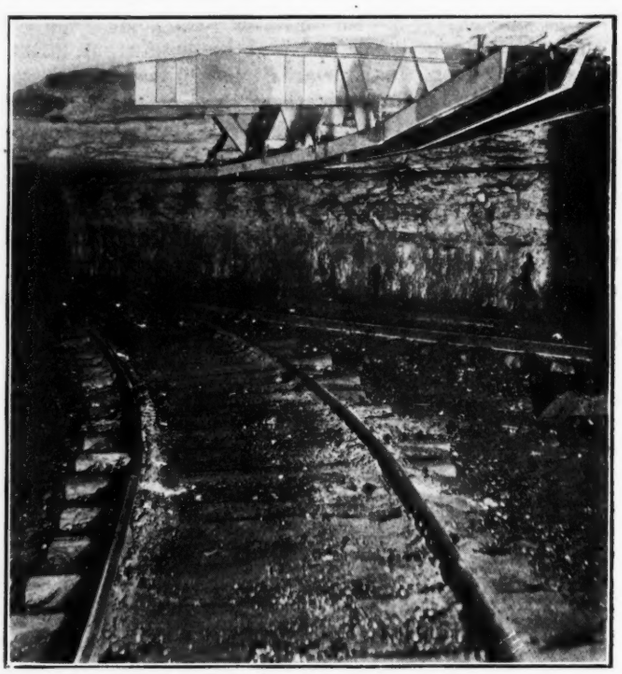
TRIP MAKER AND TRACKS, EMPTY SIDE, NO. 31 DUMP

In addition to the moving dogs on the chain in the middle of the track, dogs on fixed pivots are placed in either side of the roadway, making it impossible for a mine car to break away and run into a car coming from the dump.

the case where large trips are in use, and of course, locomotives need fewer repairs under such circumstances.

A novel system of rating is used at Lynch for stimulating the interest of motormen in the care of their locomotives. Each month on a day chosen at random the chief electrician inspects each motor and gives a percentage rating on its condition. If the rating of any one motorman falls below the average he is censured. Repeated failures are just causes for dismissal. Semi-annually cash prizes are awarded for the best record. This practice creates greater interest in the care of locomotives. Rivalry to excel, however, is a greater incentive than is the cash prize.

Locomotives are inspected and lubricated every night. Motormen are instructed to use an air line for cleaning out motors and other moving parts. For this purpose such a line is located on the empty track on the far end of each trip maker on the empty side of the dumphouses. Locomotive bumpers are cleaned by air three



TROLLEY WIRE AT A TURNOUT FROM MAIN HEADING

The supports are so accurately located that the wire is practically parallel with the curve of the track. The hangers are held by long drift pins which never come loose unless the roof falls.

times each day in order that a sure footing may be provided for brakemen.

Conditions do not favor the use of storage-battery or reel locomotives in these mines, for the rolling bottom prevents them from being used with efficiency. This fact has been confirmed by giving two battery locomotives and one reel locomotive a fair trial. On Feb. 12, 1923, the output of the three locomotives combined was 482 tons. Seven drivers working under average conditions in the mines could produce 500 tons in one day.

The average output per driver for the three sections worked by these gathering locomotives is 76.5 tons per day. Just 6.3 drivers under identical conditions could gather as much coal as the three locomotives. The reel locomotive has given better service than the two battery locomotives. This would indicate that in a non-gaseous

mine a reel locomotive is better suited for gathering than a battery locomotive.

In the Lynch system of haulage no sidetracks are necessary. Mine cars are pulled from the face of rooms onto the room heading by mules, ponies or room hoists. Neither animals nor room hoists pull the mine cars beyond the point in the heading adjacent to the room neck. The utility tram and gathering locomotives gather the mine cars which stand on the entry near the room neck and haul them to the tipple. Consequently the trolley is extended as the heading advances, and power is thus brought to the faces of headings.

Ponies are utilized in places too low for mules. To take care of 64 working places, which is the average number for a single mine section of two room sections, about 12 mule drivers must be employed. Single mules are used for gathering in a few of the places but generally two or three are required, for the rooms are likely to have dips as steep as 6 per cent. The average number of mules handled by each driver in the mines is 2½. The drivers handle an average of 72 tons per shift, both mines being considered in establishing that figure. Where the grades are greater than 6 per cent room hoists are used instead of animals.

In the Lynch mines 75 room hoists are in use, 57 of which are driven by 7½-hp. motors, 18 being equipped with motors of 3 hp. Experience at Lynch proves that for grades from 6 to 20 per cent or more the standardization of hoists to one size, driven by the larger motor, is advisable. A ⅞-in. 6-strand 19-wire rope of plough steel with a length of 500 ft. is used on each hoist. Its average life is 60 days.

Track Throughout Is Heavy and Well Laid

Tracks in principal headings, including barrier headings, are laid with 60-lb. steel and all curves have a 300-ft. radius. Tracks in room headings and cross-haulageways are laid with 40-lb. steel, the curves being struck on radii of 150 and 200 ft. respectively. Room track is of 20-lb. steel. The combined length of the tracks laid with 60 and 40-lb. steel is 37.92 miles. On all haulage wooden ties are used set on 2-ft. centers. In the rooms the ties are of steel and are spaced 3 ft. apart.

The time spent in elevating track on curves is time wasted wherever the speed is no greater than 15 miles per hour. This is the common belief of railroad engineers and of the United States Coal & Coke Co. The elevation is not needed if the track is otherwise correctly laid.

Promiscuous placing of timbers on haulage roads is not tolerated under any circumstances. The general superintendent of the company is consulted regarding cases in which set rules do not apply or, where action must be taken under short notice, the chief mine inspector directs the work. Timbers are never placed where there is any danger of their being knocked loose by derailed rolling stock.

Brake shoes of cast steel have preference over those of wood. They are more effective, are replaced with less labor and have a longer life. Under the severe service in the Lynch mines their life is 8.75 months as against 12 to 14 months in the mines at Gary, W. Va. A man without any assistance can replace a brake shoe of cast steel in 30 minutes.

The Lynch system will give to those who use it a measurable degree of regularity in mining each section of the mine. The operation will embrace as many sections as are needed to produce a given tonnage. Each is a mine within a mine. To all is allocated a specific daily tonnage (1,000 tons at Lynch) and this is to be maintained until the sections are mined out whether the working places be a half mile or five miles from the tipple. The ventilation that is provided and the haulage roads that are built will last the life of each mine area. Rooms follow close behind the advancement of headings. Stretches of room headings are advanced quickly and as quickly worked out.

As the live workings move further and further away from the tipple, the method of mining does not change, and the same number of working places move away from the tipple, the length of haul becomes greater. Consequently more mine locomotives and haulage attendents are needed. Nevertheless the system of haulage is in no wise changed. Empties are brought to the rooms in the same manner as at the commencement of the mine area. One haulage road carries all the coal coming from the mine area it serves.

Production of Coke in September Declined 248,000 Tons

Production of coke in byproduct ovens continued to decline slowly during September. The total output for the month, was 3,112,000 net tons. The daily output was 103,729 tons, as against 104,402 in August, a decrease of 0.7 per cent. Of the 70 plants, 65 were in operation and 5 were idle. The coke produced was 85.8 per cent of the present capacity of all the plants. Production from behive ovens also declined. The month's output of beehive coke is estimated at 1,373,000 tons, as against 1,494,000 tons in August. The total output from both types of ovens declined from 4,733,000 to 4,485,000 tons.

The decreased activity in coke manufacture reflected in part a decline in the output of pig iron and steel, in part the settlement of the anthracite strike. These statistics of byproduct coke production are based upon reports to the Geological Survey from all operators of byproduct ovens, including merchant plants and plants engaged primarily in supplying gas for municipalities.

MONTHLY OUTPUT OF BYPRODUCT AND BEEHIVE COKE IN THE UNITED STATES (a)
(In Net Tons)

	Byproduct Coke	Beehive Coke	Total
1917 Monthly average	1,870,000	2,764,000	4,634,000
1918 Monthly average	2,166,000	2,540,000	4,706,000
1919 Monthly average	2,095,000	1,638,000	3,733,000
1920 Monthly average	2,565,000	1,748,000	4,313,000
1921 Monthly average	1,646,000	462,000	2,108,000
1922 Monthly average	2,374,000	669,000	3,043,000
July, 1923	3,267,000	1,582,000	4,849,000
August, 1923	3,239,000	1,494,000	4,733,000
September, 1923	3,112,000	1,373,000	4,485,000

(a) Excludes screenings and breeze.

To manufacture the coke produced in September required the consumption of approximately 6,637,000 tons of coal, of which 4,471,000 tons was charged in byproduct ovens and 2,166,000 in beehive ovens. The coke industry thus absorbed about 14.4 per cent of the coal produced during the month.

ESTIMATED MONTHLY CONSUMPTION OF COAL FOR MANUFACTURE OF COKE (a)
(In Net Tons)

	Consumed in Byproduct Ovens	Consumed in Beehive Ovens	Total Coal Consumed
1917 Monthly average	2,625,000	4,354,000	6,979,000
1918 Monthly average	3,072,000	4,014,000	7,086,000
1919 Monthly average	2,988,000	2,478,000	5,466,000
1920 Monthly average	3,684,000	2,665,000	6,349,000
1921 Monthly average	2,401,000	706,000	3,107,000
1922 Monthly average	3,411,000	1,056,000	4,467,000
July, 1923	4,694,000	2,495,000	7,189,000
August, 1923	4,654,000	2,356,000	7,010,000
September, 1923	4,471,000	2,166,000	6,637,000

(a) Assuming a yield of merchantable coke of 69.6 per cent of the coal charged in byproduct ovens, and 63.4 per cent in beehive ovens.

WHAT do coal miners earn? This has been, second to none, a controverted point in every flare-up of labor trouble and in every discussion of the coal industry. The rate per ton for digging coal and the rate per hour for company men are recognized as inadequate measures of the mine worker's income, for in the soft-coal mines the irregularity of operations is notable. The year's income pays the bills.

The Coal Commission made the most elaborate study of earnings of coal-mine workers ever undertaken; a study, it is believed more detailed and comprehensive than any ever undertaken for any other industry. The Commission reports, one each for earnings of anthracite and for bituminous coal-mine workers, are a mass of figures, without interpretation. At a recent session of the American Academy of Political Science devoted to coal there were almost as many interpretations of the Coal Commission's investigation of earnings as there were speakers. One interpretation was authoritative, because it was made by Miss Anne Bezanson, associate director of the Industrial Research Department of the Wharton School, who had charge of this work for the Coal Commission. The article that follows was prepared by her for the Academy but is first published here.

What the Coal Miner Earns

In Bituminous Coal Mines Earnings per Start Are Higher Than in Anthracite Operations—Hard-Coal Miners Have More Opportunities to Work—Labor Turnover Higher in Soft-Coal Industry

BY ANNE BEZANSON

Prefacing her paper Miss Bezanson said:

THE subject of the earnings of coal miners is a large one to cover in a short paper. There are some one hundred odd separate occupations for men engaged *in and about* the mine of an anthracite colliery. While the number of occupations is somewhat less in bituminous, the diversity of occupation is still very considerable. The U. S. Coal Commission found it necessary to separate forty major occupations in anthracite and twenty in bituminous mines in order to study even the most important differences in earnings groups. This paper, therefore, can deal only with the most salient conclusions for the main occupational classes. Three things should be kept in mind in using the earnings tables prepared by the Coal Commission:

(1) The tables as published do not show annual earnings.

(2) The data were purposely compiled to stress any existing variations in earnings within occupations.

(3) The scope of the study did not allow time for analysis and interpretation of data at the time of publication.

The earnings tables of the Coal Commission were prepared to show in considerable detail, the relation of earnings to time worked. The earnings for individual employees were grouped in intervals of $100 for amount received while employed at one mine. Such a grouping was planned to bring out differences in earnings where such differences existed for the same occupation. The figures given are not, therefore, the

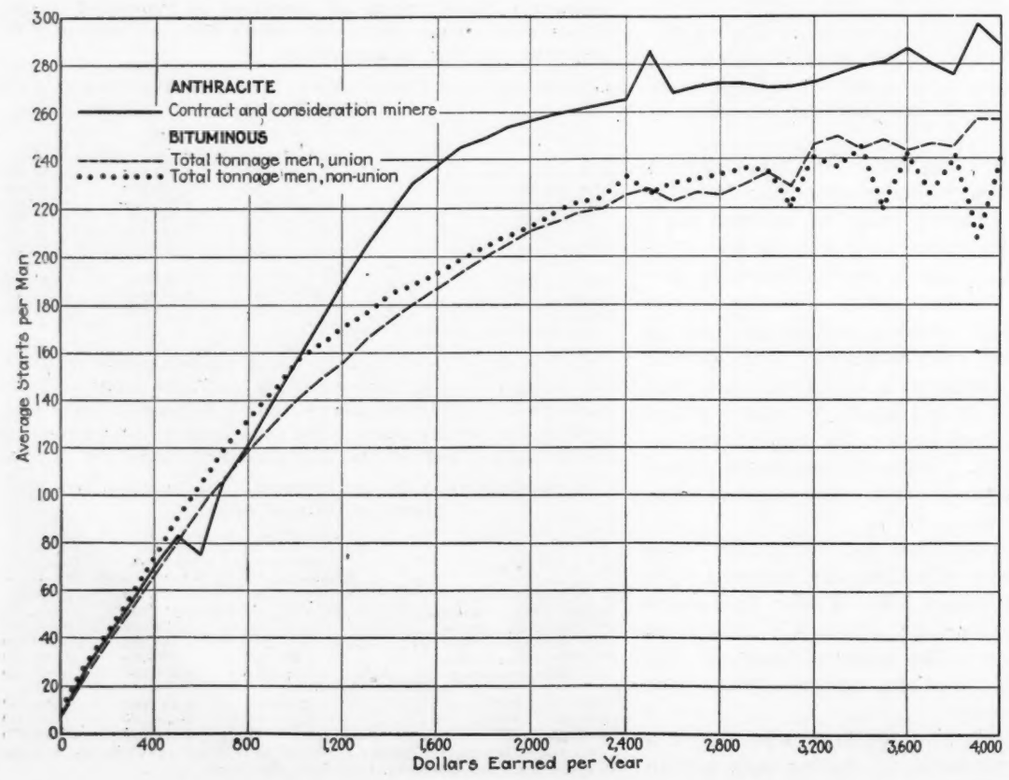


FIG. 1

Tonnage Workers

This diagram shows that tonnage men in anthracite mines work more days per year to get the same earnings as soft-coal miners. Thus in 1921 a hard-coal miner worked 270 days for $2,800, a soft-coal miner about 230 days. Union and non-union bituminous-coal workers had approximately the same earnings.

annual earnings of any employee who shifted during the year. In attempting in this paper to give summary figures for earnings, I am obscuring the variations upon which the Coal Commission reports tend to lay most stress.

It should be remembered also that the Coal Commission were necessarily occupied with an enormous problem of collection and tabulation. In getting together the mass of data it was more important to provide the primary facts than to get a few outstanding but over-summary conclusions. Everyone recognizes the necessity of sifting and interpreting statistical data collected in this way. However, the enormity of the task of tabulating earnings material did not leave sufficient time after the tabulation was done for detailed interpretation of all the data. The figures will, therefore, be the basis for discussion for some time by students interested in careful study of the problems of earnings in coal.

Three facts should be borne in mind, in using the summarized data: (1) That one is obscuring important variations; (2) that the earnings figures must be interpreted in connection with the wage rate, turnover and irregularity studies of the Commission, and (3) that the figures do not give annual earnings.

EARNINGS in the coal industry can be summarized for three major occupational groups: The piece work, or tonnage, occupations in anthracite collieries comprise the contract miners and their laborers; in bituminous mines there are three important groups, *machine miners*, engaged in operating the coal undercutting machines; *pick miners*, engaged in undercutting by pick, and shooting and loading their own coal; *loaders*, engaged in shooting and loading the coal that has been undercut by the machines.

About 28 per cent of all employees in anthracite, and 16 per cent in bituminous work on the surface and will be referred to as *outside daymen*. The men engaged in haulage, maintenance of the way, and regulations of ventilation are generally paid on an hourly basis and are referred to as *inside daymen*.

Earnings of Tonnage Workers Compared. — It is well, first, to consider the relation of earnings for tonnage workers in the anthracite and bituminous industries. The accompanying diagrams facilitate comparisons. They show, for instance, the relation between time worked and earnings of contract miners in anthracite and of all tonnage workers in bituminous coal. Fig. 1 compares the time worked in a year with dollars earned by contract miners, non-union tonnage men and union tonnage men. The curves show striking differences in the number of days worked to make the same annual earnings. It is apparent that for earnings up to $800 per year, the time worked by union tonnage men and anthracite contract miners is almost identical. Above $800, tonnage men in bituminous coal fields work fewer days to make the same earnings as contract miners in anthracite, the greatest difference being found at the $1,800 division, with a range of 50 days in working time. The similarity of days worked to earn up to $800 is surprising when compared with the wide difference in time for higher earnings.

One would have expected the bituminous curve to be below the anthracite curve throughout. Two causes account for the discrepancy; first, the turnover is higher in the bituminous group. This means that a relatively large number of men in the bituminous industry remain only a few days on the payroll of one mine. The earnings tables indicate that men do not make normal earnings in the industry until they have been a considerable time in the employ of one mine. The weighting of the bituminous curve with this group of short service workers tends to increase the time worked and brings the curve closer to the anthracite curve. The

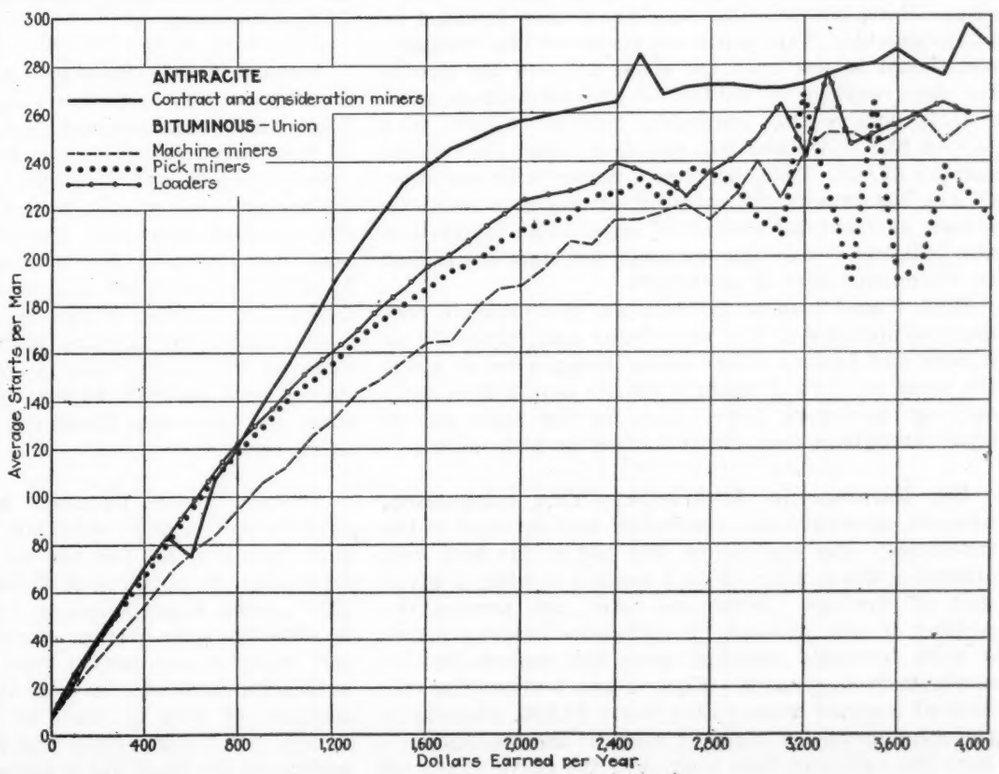


FIG. 2

Union

Up to about $3,000 per year union machine men make higher earnings for the same days worked than loaders or pick miners. Loaders and pick miners earn at about the same rate. Above $3,000 per year pick miners make the most per day worked.

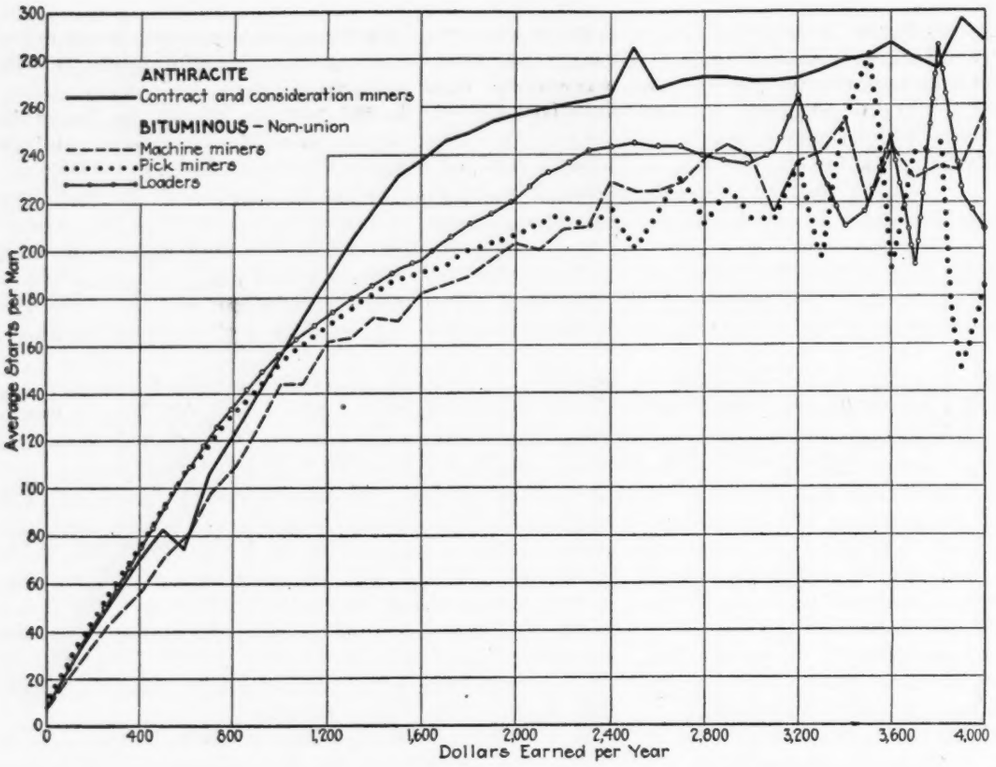


FIG. 3

Non-Union

Non-union tonnage workers earning above $1,000 per year work fewer days than anthracite miners did in 1921. Above $2,400 per year pick miners in the non-union fields have the higher rates of pay. Below $1,000 there is little difference in rates of earning.

second cause is of equal importance; namely, that the average length of start is shorter, if considered throughout the year for all mines, in the bituminous coal industry than in the anthracite field.

Turning to the curve of tonnage men in the non-union field, it is apparent that to earn up to $1,000 per year, tonnage men work more days than either anthracite or union bituminous-coal mines. Attention is directed to the earnings above $3,000, showing non-union men working fewer days for the same dollars as the union area. Here, however, the number of men involved is inconsiderable. The important stress in this comparison should be put upon the space between the curves for days worked in anthracite and bituminous coal.

It is notable that anthracite contract miners who earned $3,200 worked but ten days more than those earning $2,000. This indicates a rather wide variation in the opportunity for earning among men working almost an identical number of days. The comparison also indicates clearly that earnings per start are higher in bituminous than in anthracite.

Figs. 2 and 3 show the earnings for separate tonnage occupations in the bituminous coal mines. Pick miners and loaders in the union group earn at about the same rate, while machine miners have higher daily earnings and work fewer days for the same annual total throughout than either loaders or pick miners.

Big Earnings in Anthracite. — This comparison, however, disregards the number of men involved in the industries. The only factor that has so far been considered is the number of days worked to make a given unit of earnings. When one takes into account the number of men involved, the anthracite industry makes a more favorable showing, since the opportunity for employment is greater. Figs. 4 and 5 show that the bulk of contract miners earn above $1,000, whereas in the bituminous-coal industry more of the tonnage men have low earnings than high, and the curve slopes off gradually, containing fewer men as the higher earnings groups are reached. The anthracite curve, on the contrary, decreases gradually in the number of men involved in each interval to $1,000, and then begins to increase, reaching a high point at about $1,800 to $1,900. Even if the year 1920 is taken for the bituminous-coal industry, instead of the inactive year of 1921, the curves show the same general outline, although the numbers of men making the higher earnings are then more significant. This raises the question of the actual average earnings.

Average Yearly Earnings in 1921.—What then, is the average number of starts made by contract miners? What was the average annual earnings in 1921? How do these earnings compare with annual earnings for all tonnage men in bituminous mines? For the year 1921 the average time worked by contract miners in anthracite was about 250 days. The average earnings for that year was between $1,900 and $2,000—to be exact, $1,922. The union soft-coal miners averaged about 134 days in 1921, a year of inactivity; non-union men made a somewhat better showing, with 151 days. The average earnings for tonnage men in both union and non-union groups was between $1,000 and $1,100—to be more exact, the figure was $1,034 in union and $1,051 in non-union mines.

Average Yearly Earnings in 1920. — The average days worked in 1920 were 219 for union soft-coal tonnage men and 221 for non-union tonnage men. This gives average earnings of $1,750 to $1,800 in the year 1920 among bituminous-coal tonnage men. It should be noted that the average starts made are about thirty less (roughly one month) than the average starts for anthracite miners in the year 1921, with a difference in earnings of $156 in favor of the anthracite contract miners. It is understood that all these comparisons in anthracite are made for a period before the present 10

per cent increase in rates. It should be understood, also, that these are not the average earnings of full-year men but a figure which is based on all tonnage workers. The figure for earnings of full-year workers in anthracite is not available. In bituminous mines the average earnings of full-year employees is about $400 higher than the figure for average earnings of all employees, or about $1,425 to $1,450 for tonnage men in 1921 and $2,025 to $2,075 in 1920.

Contract Miners' Laborers. — Contract miners' laborers in the anthracite industry should not be compared with any of the occupations in the bituminous-coal industry. They work for the miner, and are paid a proportion of the miner's gross earnings. This group shifts more than any other men in any part of the coal industry. Too few of these laborers remain on the pay-roll of any one mine throughout the year to give a figure upon which to base annual earnings. The figures as collected by the Coal Commission show earnings of miners' laborers of $1,200 for about 200 days' work. There is no reason to think that this is the average working time of contract miners' laborers, since there is a real shortage of laborers and little time is lost in shifting from job to job. It should certainly be fair to take the average days worked by contract miners, and the average daily earnings of the laborers which is $5.87, and arrive at a figure of income which gives $1,468 for the year 1921. This is, however, an estimated figure, and is not arrived at by the careful calculations upon which the other figures are based.

At this point I may say that the average earnings in this paper are net earnings derived from the tables published by the Coal Commission, as are the average days worked. The figures were then checked by using the average daily earnings found by the Wage Rate Section of the Coal Commission and the number of employees involved were checked with the turnover figures. This makes three sources for verifying the final conclusions, and it is fair to add that the computations agree very closely, there being a difference of only a few cents in the daily earnings as computed from the data from these different sources. Averaging the earnings of contract miners' laborers and contract miners gives an average earning for all tonnage workers in anthracite mines of about $1,780 in 1921 for an average working time of 250 starts.

A further summary comparison is possible in connection with the earnings of tonnage men. When weight is given to the number of men in each $100 interval of earnings an average earnings figure per start of $7.75 to $8 is obtained for anthracite contract miners and all unionized bituminous tonnage workers, there being a difference of only 4c. per day in the average earnings per start for these two groups in 1921. In the non-union field the average earnings per start is about 75c. less than in either anthracite or bituminous coal, falling between $7 and $7.25 per start.

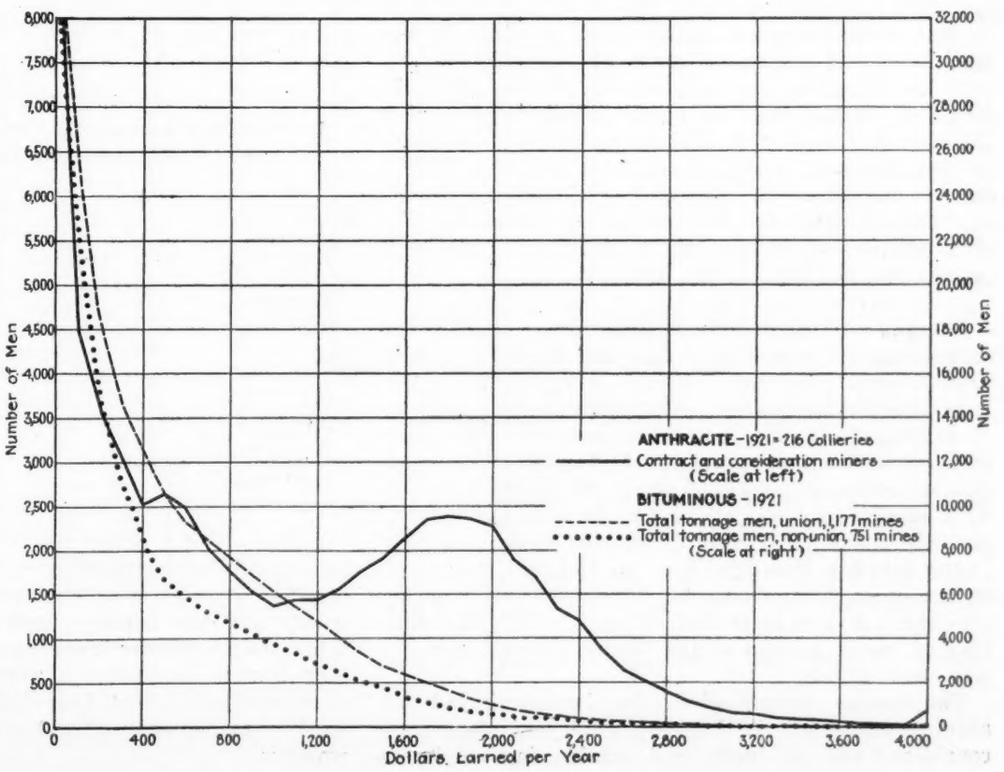
In the discussion up to this point, the earnings of the men engaged in actually mining coal have been covered. The tonnage group constitutes almost three-fifths of all employees in bituminous and slightly over two-fifths of anthracite employees. The remaining employees are divided into outside and inside day occupations. The employees paid by the hour normally work more days in a year than the tonnage workers.

Earnings of Outside Daymen. — No comparison should be made between anthracite and bituminous coal for outside day occupations, taken as a whole. The anthracite industry is equipped with elaborate facilities for preparing the coal for market. The proportion of outside employees used in washing, breaking and sizing the coal is very much greater than any group of workers outside a bituminous mine. Besides, 11 per cent of all outside day workers in anthracite are slate pickers, mainly boys. There is no comparable group of workers around a bituminous-coal mine. If one excludes boy

FIG. 4

Earnings in 1921

Comparing anthracite with bituminous coal in 1921, this diagram shows that proportionately more hard-coal tonnage men make high earnings than do soft-coal workers. The "hump" in the curve between $1,600 and $2,000 shows that hard-coal miners make uniformly higher money than soft-coal miners.



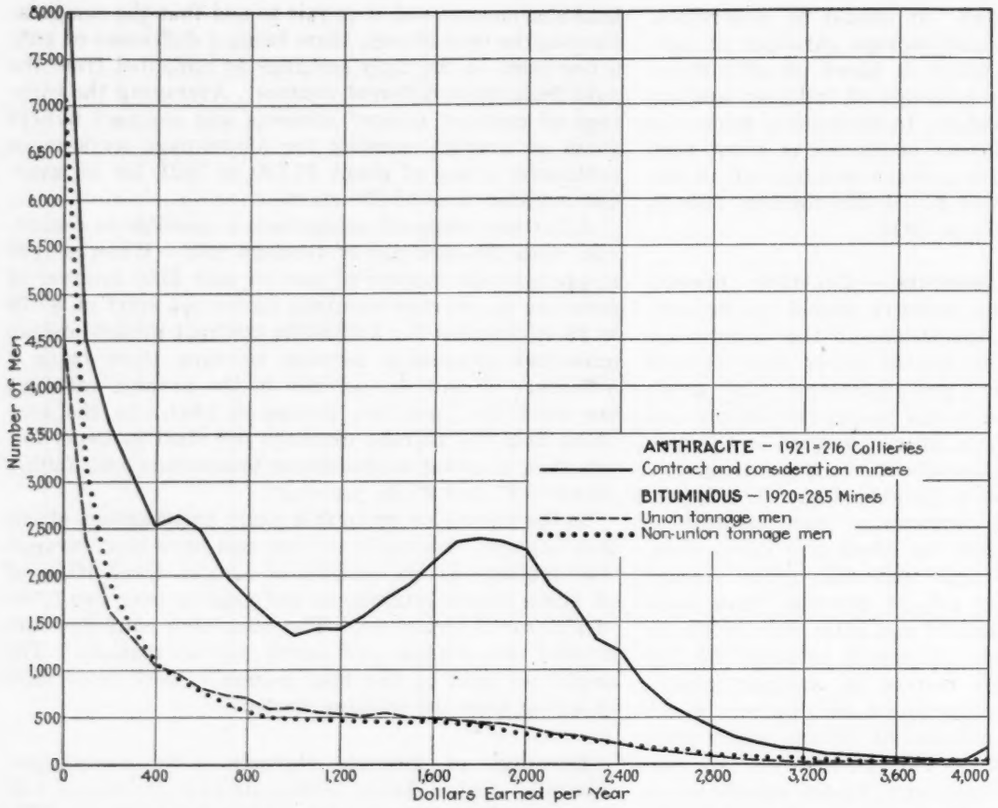


FIG. 5

1920-1921

Comparing hard-coal tonnage men in 1921 with soft-coal in 1920, this diagram shows again the high percentage of anthracite workers making the high earnings. Union and non-union bituminous-coal tonnage men range about the same.

employees, and takes all outside workers in anthracite in the year 1921, the average eight-hour days worked per man was about 293. The average earnings was about $1,320.

In the bituminous-coal industry outside union workers averaged $1,445 in 207 days; non-union workers averaged about $1,200 in 218 days. The year 1920 gave more opportunity for employment of daymen. Outside workers averaged $1,850—$1,875 for union and $1,700-$1,750 for non-union workers. It will be seen that even in 1921 outside daymen made higher earnings in the bituminous coal than in the anthracite industry, and in 1920 the difference was as great as $400 to $500. It should be recalled that one is here comparing the year 1920 in bituminous with 1921 in anthracite. The comparison, however, is a fair one, since the year 1920 is only six days above the average operation of the bituminous-coal industry for the last twenty years and the year 1921 was an average one in anthracite. The occupations are, however, widely different.

Earnings of Inside Day Occupations.—Inside day occupations are higher paid than are those for outside employments. The union mines averaged 175 eight-hour days for inside men in 1921 with average earnings of $1,293. The inside non-union men averaged about 189 days with average earnings of about $1,125. Inside men in anthracite averaged about 290 eight-hour days with average earnings of $1,480. It will thus be seen that the inside worker in anthracite made somewhat higher earnings than the inside daymen in either union or non-union bituminous-coal mines, but his working time was 100 days more than either. In 1920 the earnings of inside daymen in the bituminous-coal industry was about $1,600.

The figures already given for daymen include all short-service men. If full-year employees alone were considered and all inside and outside day employees grouped, the average earnings in the bituminous-coal industry would be about $1,850 in 1920 and $1,570 to $1,600 in the less regular operation of 1921.

Perhaps the separate occupations can be more easily compared by the average daily earnings of a selected group of well-known occupations. The content of work covered by the same name is not necessarily identical between fields or even within fields and it will be remembered that the opportunity for employment is not the same in the two industries. Yet in so far as any comparison can be made, these are indicative of the earnings of an eight-hour day in the various fields.

Average Daily Earnings in Fifteen Day Occupations in Anthracite and Bituminous

Occupations	Anthracite	Bituminous	
		Union	Non-union
Outside			
Blacksmith	$5.35	$7.57	$6.36
Carpenter	5.27	7.14	5.94
Engineer	4.98	7.29	5.97
Fireman	4.76	6.95	5.41
Stableman	4.28	6.07	5.07
Laborer	4.26	6.55	4.58
Miscellaneous	4.38	6.74	5.37
Inside			
Bratticeman	$5.19	$7.42	$5.96
Doortenders	3.18	4.48	4.26
Drivers	4.67	7.47	6.22
Pumpman	5.10	7.14	5.53
Timberman	5.89	7.52	6.26
Track layers	5.22	7.35	6.09
Laborers	4.92	7.16	5.08
Miscellaneous	4.96	7.41	5.99

Looked at in a broad way there was in 1921 a surprisingly balanced relation between the average earnings per start by contract miners in the anthracite industry and the tonnage workers in bituminous coal. When the whole year is considered the anthracite miner earned more by reason of more continuous operation; thus relatively about four times as many anthracite workers earned above $1,200 as bituminous-coal tonnage workers.

The real difference in the industries is found in the earnings of daymen. Here there is a difference in daily earnings of roughly $1.75 to $2.25 a day in favor of the bituminous worker. Even with this difference the inside day worker earned about $200 more in 1921 in anthracite than in bituminous coal by reason of more opportunity to work.

In the case of outside workers the annual earnings as well as the daily earnings were lower in anthracite than in bituminous coal.

In 1921 contract miners in anthracite averaged about $1,922, making 250 starts; contract miners' laborers in the same working time would earn between $1,465 and $1,470. During the same year inside daymen in anthracite had about 40 eight-hour days more opportunity for employment and averaged $1,475 to $1,500, while outside daymen by working an average of 3 more days than inside men earned $160 less. When boys are excluded from this outside computation the yearly earnings of outside men fall from 8 to 8½ per cent lower than those of inside daymen. Judged from the point of view of spending power the contract miners' laborers are in about the same position as the inside daymen in anthracite, owing to the opportunity of the latter for earnings when the mine is idle.

The real problem of earnings in the coal industry is due to the wide fluctuations above and below the average; variations due in part to mining conditions. For this problem attention must be given to the detailed reports published by the U. S. Coal Commission on rates and earnings.

GOVERNOR PREUS, OF MINNESOTA, has been quoted in the press as predicting that public sentiment would force Pennsylvania to bring about some effective regulation of the hard-coal business. Governor Preus believes the State of Pennsylvania should declare coal a public business, as was done with elevators in Minnesota.

Production of Bituminous Coal Producers Classified By Size of Output in 1895, in Net Tons

	Over 500,000	100,000 To 499,999	50,000 To 99,999	10,000 To 49,999	Under 10,000	Total
Alabama	4,389,486	953,474	266,360	434,411	33,725	6,077,456
Arkansas	698,196	0	0	17,000	19,200	734,396
California	0	0	0	66,603	8,850	75,453
Colorado	1,471,667	1,082,696	114,487	332,068	65,909	3,066,827
Georgia	0	260,998	0	0	0	260,998
Illinois	4,283,583	6,985,355	2,984,092	2,408,503	925,506	17,587,039
Indiana	0	1,929,523	1,368,941	556,985	86,489	3,941,938
Indian Territory	0	1,098,800	0	30,500	5,303	1,134,603
Iowa	0	1,714,736	1,009,112	937,406	275,245	3,936,499
Kansas	954,827	1,560,449	291,209	245,291	121,694	3,173,470
Kentucky	0	1,078,848	226,435	233,277	29,220	1,567,780
Maryland	2,636,291	1,059,580	67,299	20,401	5,282	3,788,853
Michigan	0	0	0	99,554	10,240	109,794
Missouri	0	582,431	501,996	458,327	194,727	1,737,481
Montana	501,627	197,200	107,700	51,798	11,250	869,575
New Mexico	0	630,692	0	69,526	7,461	707,679
North Carolina	0	0	0	19,400	1,500	20,900
North Dakota	0	0	0	20,160	15,437	35,597
Ohio	1,164,613	6,141,477	2,750,832	1,958,863	420,746	12,436,531
Oregon	0	0	58,025	11,200	4,460	73,685
Pennsylvania	18,798,118	20,230,975	5,811,705	4,288,863	250,234	49,379,895
Tennessee	0	899,199	759,525	218,388	54,225	1,841,337
Texas	0	283,932	0	182,433	11,340	477,705
Utah	0	352,165	0	58,403	15,175	425,743
Virginia	890,365	0	132,274	295,113	11,515	1,329,267
Washington	0	975,074	85,688	106,410	20,878	1,188,050
West Va.	574,351	5,523,183	3,244,606	1,825,317	71,712	11,239,169
Wyoming	1,382,393	583,480	218,450	36,870	13,588	2,234,781
Total	37,745,517	54,034,267	19,998,736	14,983,070	2,690,911	a129,452,501

a From records now available. United States Geological Survey reported 135,118,193 net tons in "Coal in 1895."

From U. S. Coal Commission Report on Engineering and Management.

Advantages of Centrifugal Pump For Coal-Mine Drainage

Recent Developments—Comparing Centrifugal and Reciprocating Pumps on Basis of First Cost and Operating Cost — Economies of Automatic Operation

BY GUY V. WOODY
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Wilkes-Barre, Pa.

IN DETERMINING whether a centrifugal or reciprocating pump should be purchased for a particular pumping condition, a mine operator or his engineers must carefully consider several factors. These factors vary greatly for the different classes of mining. This discussion, however, will apply to the application of the two types of pumps as used in the anthracite mines as there is undoubtedly more water handled per ton of material taken out in the anthracite mining region than in any other. As a rule, also, the water handled has a higher degree of acidity than encountered elsewhere.

Much has been done within the last ten to twelve years in perfecting the centrifugal mine pump for handling acidulous mine water. Along with this development the designer has been able to greatly increase his efficiencies until at the present time there is not the marked difference in that regard which formerly existed between the two types of pumps. Operating efficiencies of 70 per cent at 1,000 g.p.m. and 80 per cent at 3,000 to 4,000 g.p.m. can be obtained with centrifugal mine pumps at the present time. The centrifugal mine pump also has evolved from a fairly complicated piece of machinery with diffusion vanes to a simple unit without diffusion vanes and few moving or wearing parts.

To answer the question under discussion the following approximate figures are interesting:

PUMP DATA Type of Pump Material	Horizontal Duplex Cast Iron, Cement-lined	8 in. 6-Stag Centrifugal Bronze
No. of pumps in station	2	2
Capacity of each pump, g.p.m.	1,500	1,500
Head in feet	600	600
Pump efficiency, per cent	85	75
Combined efficiency, per cent	78	69
Kw. input to driving motor	217	246
Kw.-hr. per year for ½-time operation	950,000	1,078,000
INITIAL COSTS		
Cost of pumps	$28,000	$9,000
Cost of motors and control apparatus	6,000	5,000
Cost of pumproom	8,000	2,500
Cost of foundations	500	200
Cost of installing	1,200	300
Total initial investment	$43,700	$17,000
OPERATING COSTS FOR HALF-TIME OPERATION AT 1½c. PER KILOWATT-HOUR		
Interest and depreciation at 15 per cent	$6,560.00	$2,550.00
Yearly cost of repairs	2,400.00	600.00
Yearly cost of labor making repairs	1,400.00	200.00
Yearly cost of power	14,250.00	16,170.00
Yearly cost of operators	5,480.00	5,480.00
	$30,090.00	$25,000.00

From the above it is apparent that on the assumption of a power rate of 1½c. per kilowatt-hour and of half-time operation, the centrifugal pumping units undoubtedly should be purchased, as they indicate a saving of approximately $5,000 per year. We can readily see that as the capacity of units increased for a larger station, with increased efficiency of the centrifugal pumps,

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Abstract of Paper presented at the Open Forum of the American Mining Congress Convention held at Milwaukee, Wis., Sept. 24-29, 1923.

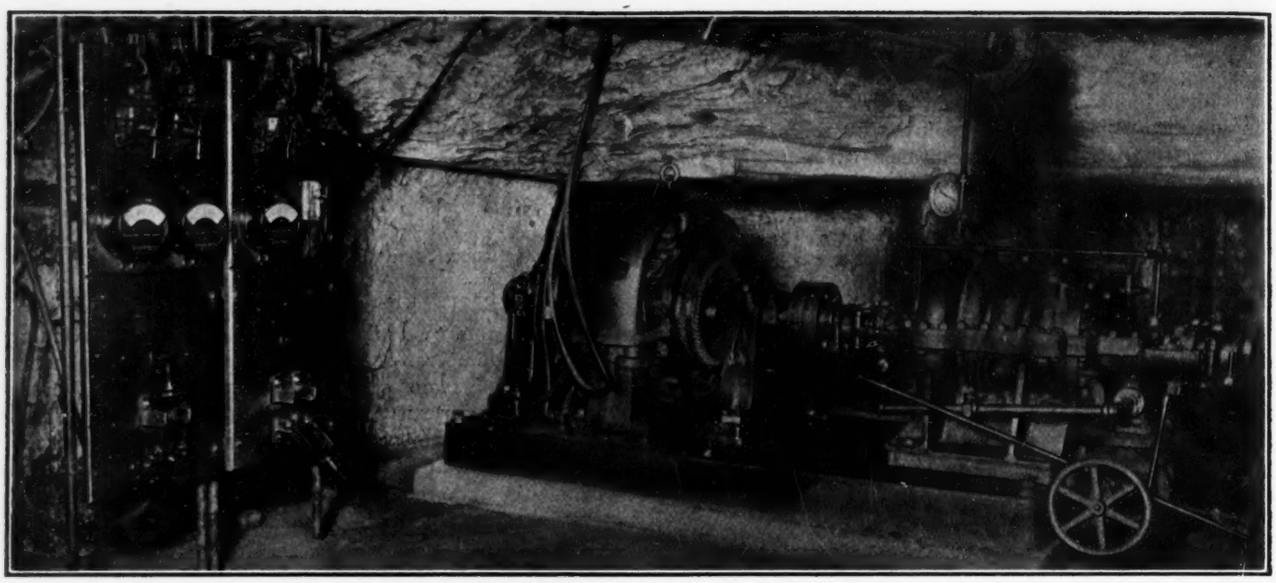


FIG. 1—FOUR STAGE BRONZE PUMPING UNIT
A unit is driven by a 225-hp. direct-current motor which pumps against a 350-ft. head.

the operation cost would be even more in favor of the centrifugal pump. The converse of this is true, i.e., as the units grow smaller, the reciprocating type begins to gain in favor until when a point of 750 g.p.m. is reached it is probable that the reciprocating pump, especially at high heads, is the more economical.

The results of the above tabulations would, of course, not show the centrifugal pump so favorable if the power costs were higher and the units operated more hours per year. To show this the following operation costs, based on three-quarter time operation and 2½c. per kilowatt-hour, show that the centrifugal pump is favored by an operation cost of only $2,235 per year instead of over $5,000 per year on the first-mentioned basis.

One question has often been brought up when discussing the comparative operation of centrifugal and plunger pumps: "What is the average efficiency of these two types of units over an operating period of five or ten years?" We can answer this only by saying that if both types of pumps are kept in repair and are given the amount of attention that they should have, their relative efficiencies will remain about the same. Many operators of both types of pump, however, state that the reciprocating pump under moderately high heads increases in slippage and therefore decreases in efficiency faster than the wearing rings on the centrifugal pump reduce the efficiency of this type of pump.

The amount of foreign material in the water as well as the acid content of the water has an important bearing upon the reduction of efficiency, but whether this reduces the efficiency of one type of pump any faster than it does the other type is not evidenced by any data which has come to our attention. We might add that the low heads per stage and extra wide wearing rings, which are now a part of the design of centrifugal mine pumps, have done much to lower the internal leakage and to maintain the efficiency.

OPERATING COSTS FOR THREE-QUARTER TIME OPERATION AT 2½c. PER KILOWATT-HOUR

Interest and depreciation at 15 per cent	$6,560.00	$2,550.00
Yearly cost of repairs	2,400.00	600.00
Yearly cost of labor making repairs	1,400.00	200.00
Yearly power cost	35,600.00	40,395.00
Yearly cost of operators	$5,480.00	$5,480.00
	$51,440.00	$49,225.00

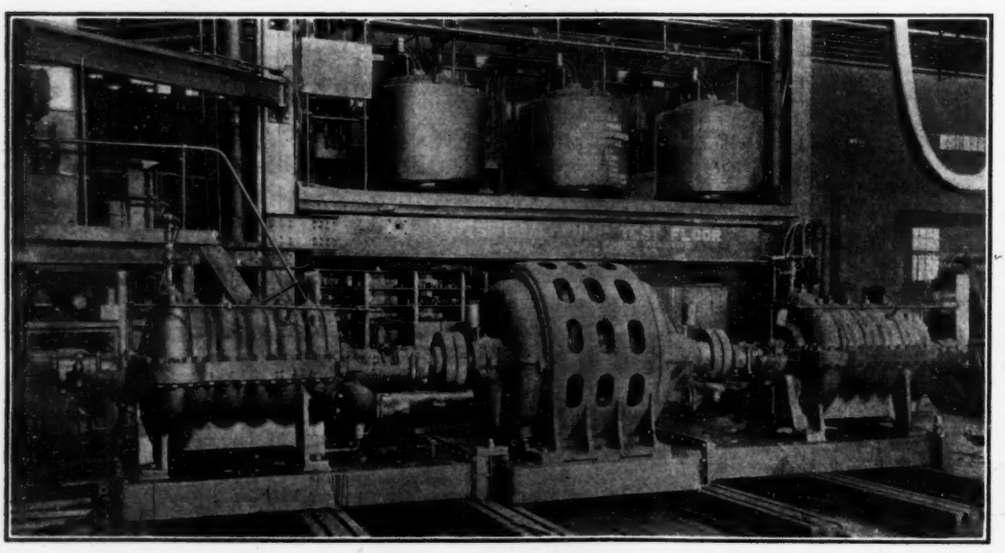


FIG. 2

Pump For High Head

This pumping unit is divided into two separate pumps. This usually is done so as to avoid the necessity of unusually large casings.

Another point which many believe is in favor of the centrifugal pump, especially on units having a capacity of 1,000 g.p.m. and more, is their size. This likens a centrifugal pump to the mobile artillery of the army in that it can be quickly moved to places of emergency. This often is important to the mine operator.

For the foregoing reasons it is the opinion of many pump users that each centrifugal pump problem should be figured out on a basis somewhat as mentioned above, taking the actual factors which enter into the particular installation under consideration. In general, however, it would appear that for pumps having a capacity of 1,000 g.p.m. and over, with heads up to 700 or 800 ft., the centrifugal pump would be the more satisfactory type of unit to install. At capacities under 1,000 g.p.m., particularly at the higher heads, one would be inclined to favor the reciprocating type of unit. At the low heads, however, at these smaller capacities, this probably would not hold true and centrifugal pumps could again be economically applied.

A few general rules which should be set down as standardized requirements of centrifugal mine pumps handling acid mine water containing more or less grit or silt, are: (1) All parts coming in contact with the water should be made from a so-called acid-resisting bronze. Two different mixtures of bronze should not be used in the same pump. (2) Low heads per stage should be maintained, these heads approximating 100 ft. In fact, low heads per stage necessitate a design of moderate pump speeds. (3) No dowels, screws or washers should be used on the interior of the pump to hold any parts in place. (4) A type of gasket packing should be used which will prevent acid water from attacking the steel bolts holding together the top and bottom half of the pump casing. Shaft sleeves should be so designed and packed as to prevent water passing through joints and attacking steel shafts. (5) Moving and stationary parts, separate from the pump casing, should be kept to a minimum and all parts should be heavy in section so as to compensate for excessive wear.

Another point which perhaps does not enter into this particular discussion, but which is important, is the automatic priming and operating of all types of pumps. Complete automatic operation of centrifugal pumps has recently been perfected, thereby effecting a saving in the labor cost of pump operators that will amount to something more than $5,000 per year per station. Smaller size reciprocating pumps have been operated without attendants by automatic starters, the starting and stopping of the pumps being accomplished by float valves. Until recently, however, it was not deemed feasible or even possible to apply automatic starting and stopping to centrifugal pumps where the sump from which the centrifugal pump took its water was below the level of the pumproom floor. Most of the earlier centrifugal pumps were installed with foot valves on the suction line and were primed by filling the column pipe to a level above that of the top of the pump, thereby making sure that the pump would take its water. These foot valves gave considerable trouble and later steam and air ejectors were used, and at a still later time recourse was had to motor-driven vacuum pumps. Where air is available and where pump operators are on duty the use of an air or steam ejector is a simple and satisfactory method for priming.

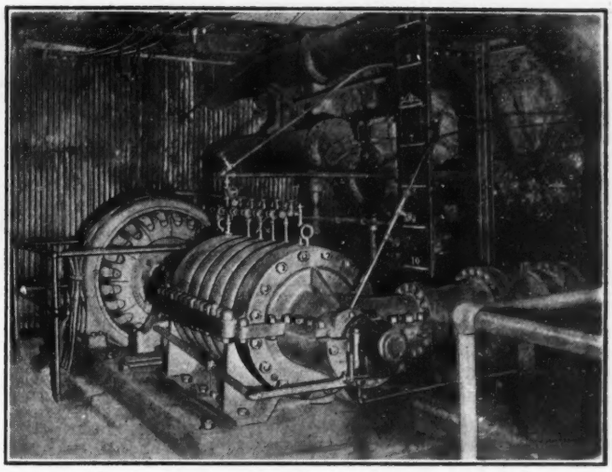


FIG. 3—A 10-IN. SIX-STAGE UNIT
This pump has been in operation since 1915 at a mine of the Lehigh Coal & Navigation Co.

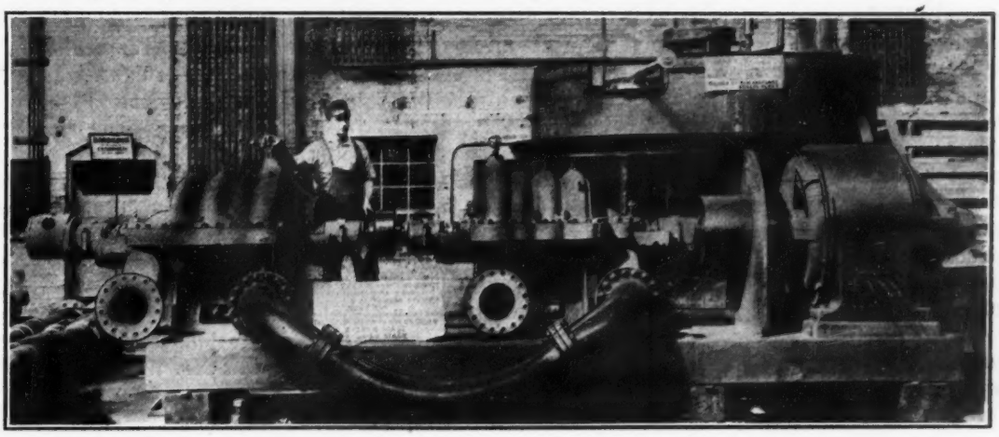
Due to certain labor conditions, in the anthracite field particularly, it is necessary that the pump operators work in three shifts. This increases the cost of this class of labor to a considerable amount and since "necessity is the mother of invention," a new scheme has been developed and put into use on centrifugal pumps which makes it possible to dispense entirely with the pump operator.

The operation of the automatic centrifugal pumping outfit is as follows: A motor-driven vacuum pump controlled by a float switch in the sump is used for priming the centrifugal pump. Vacuum regulators, pressure regulators and bearing thermostats are used and connected in such a manner as to give ample protection to the pump and motor. The motor is protected against hot bearings, excessive overloads, failure of power and the pump against excessive suction lifts, air leaks, lack of priming or broken discharge lines.

FIG. 4

Heavy Duty Pumping Unit

Where the water is very acidulous and gritty the pumping head per stage usually is less than 100 ft. This pump is used on an 800-ft. lift.



Proud of Their Product Welsh Operators Sell on Reputation

With Few Exceptions, Scrupulous Attention Is Given to Quality of All Shipments—Radical Labor Element in Evidence—Overwhelming Sentiment for Nationalization of Mines

BY PAUL WOOTON
Washington Correspondent of *Coal Age*

BECAUSE of its quality, there never has been a time when Welsh coal has been a drug on the market. There have been many times when it has been sold at a loss, but the price never has gone so low that the loss would not have been greater were production to have been suspended entirely. The operators in the Welsh field believe they have the best coal in the world, and they have sold that idea to a large number of buyers in many countries. The coal of southern West Virginia is the only product which they will admit approximates the value of their own. Their trade names have become widely known. In their foresighted way of preserving the reputation of these coals, the collieries which have built up the reputation of these names pay scrupulous attention to the quality of all shipments.

There are, of course, some unscrupulous shippers in Wales who take advantage of any emergency to forward dirty or poor-quality coal. This practice, however, has brought about a bitter feeling against such shippers, who by their action injure the reputation of all coal from Wales.

As a result of the abnormal situations which have occurred and recurred since the beginning of the war, a considerable number of irresponsible speculators have fastened themselves on the British coal industry. They are the source of great annoyance to the responsible and established companies. They frequently make lower bids than the market justifies, in order to get business. They think nothing of failure to deliver if they cannot get the coal, and as they have little or no financial responsibility, the foreign purchaser has no redress. The effect, however, is to injure the reputation of the field generally and to inflict serious losses on responsible coal concerns, since they are forced at times to meet prices being quoted by the "fly-by-nights."

RADICAL ELEMENT NUMEROUS IN SOUTH WALES

Labor in south Wales is regarded as being much more radical than in any other of the thirteen coal-producing districts in the British Isles. This in turn calls forth a more radical counter-policy, so that the operators in that section are reputed to be less conciliatory than in other fields. Even in south Wales, however, the union is highly conservative as compared with many of the district organizations of the United Mine Workers of America. To this generalization at least one exception must be made. British labor overwhelmingly favors nationalization of the coal mines. Frank Hodges, secretary of the miners' federation of south Wales, is highly educated, and, as is said over there, has "letters after his name." His ability is recognized universally, as is that of most of the labor leaders, district and national. As in America, the leaders among the operators are no match for those who have come to the top among the workers.

In that connection it may be mentioned that the union in Great Britain feels that it has a very sympathetic friend in John L. Lewis, who is much admired by labor in the British fields. "Why shouldn't he be friendly to labor over here?" one man said to me. "He has a good British name: 'L' for London; 'e' for England; 'w' for Wales; 'i' for Ireland, and 's' for Scotland."

As in America, the conservative leaders have difficulty in keeping the rank and file from plunging blindly after some radical agitator. They are somewhat like a certain shepherd, to use an example cited to me on the floor at the coal exchange at Cardiff. This shepherd was taking his flock across a swift channel on a ferryboat. He stooped over to tie his shoe and was butted heavily by the flock's ram. This so angered the burly shepherd that he grabbed the ram by the horns and threw him overboard. No sooner had the ram hit the water than the flock began to follow. Most of the sheep were lost before the remainder could be prevented from following their leader.

In certain instances, labor in Great Britain has shown just as little judgment in following certain self-constituted leaders, but, being Anglo-Saxons, the tendency to do unsound things is nothing like so marked as is the case in the United States. The conservative leaders have their men much better in hand and do not have to resort to as much demagoguery as do the conservative labor leaders in America.

MUCH OF MINE TIMBER IS IMPORTED

Labor in the Welsh field lost heavily this year because of a series of foolish strikes, much like strikes in our building trades over jurisdictional awards. There was no quarrel between the men and the operators, but the Miners' Federation and Craftsmen's unions staged a bitter conflict. This stopped production just at a time when coal prices were high and, in addition, ran up the cost of operation so that the men lost heavily in wages and diminished the profits in which they share. There never has been a strike in south Wales during which the men abandoned the pumps. Such action would cause incalculable harm in mines of such great depth and in a formation which is hard to hold at best. Extensive timbering must be done. Most of the props must be imported. France and Finland have been the chief sources of supply but now Nova Scotia is supplying a material part of the requirements.

As a consequence, props are very expensive, but the expenditure for them has been greatly reduced under the profit-sharing wage. This item is cited by operators as one of the best examples of the benefits following a real interest on the part of the workers in the profits of the operation.

Next week Mr. Wooton will describe how the British wage agreement of 1920 worked.

The Miner's Torch

The Mine Foreman: An Imaginary Book Review

NO SUPERINTENDENT can read this book without saying to himself, "I wish I had a foreman like that fellow; I'd be able to leave the job once in a while and really enjoy myself." Time was when the average foreman took entire responsibility for the inside of the mine just as the man we have been reading about, but somehow we don't find many that can measure up to that standard now. Those who do, get promoted to superintendent's jobs very quickly just as the hero of the story did, but they don't have to trust to luck nor save the manager's daughter from a mob to get there.

Even though we don't run across such animals every day it's interesting to read about them. The description of his encounter with two dissatisfied miners in different sections of the mine who were made happy on promises of new places as soon as possible and then simply allowed to remain idle a few days and change places with one another unawares is almost too ridiculous to be true, and yet we can all recall mine foremen diplomatic enough to pull such stunts successfully.

It's almost possible to look at a map of the workings of any mine and tell whether the foreman in charge is of that type because it takes such a foreman to get all of the rooms worked and to keep all of the headings driving. I have been furnished with many a laugh listening to foremen trying to explain why blocks of coal had to be left on certain headings in their section of the mine and then getting them to compare notes with other foremen who were able to control their miners so that no blocks of coal *had* to be left.

Perhaps if the mine foremen who are able to get all of their rooms worked could expect some special recognition because they have helped to conserve our natural resources, the figures used as representing the average recovery in tons per foot acre for different localities might be revised upward considerably.

The author does not suggest that his mine foreman could have been happier nor would his services to his company have been more valuable could he have looked forward to special recognition or larger rewards, but we must remember that he was interested only in giving us the picture of a mine foreman appearing as the hero of a romance, and a discussion of motives and rewards has no place in romantic writing.

The author of the book does show convincingly, however, that the life of the average mine foreman can be used as narrative matter furnishing interesting reading, but as I finished the book I found myself wondering if the life of a mine foreman holds much of interest to the man who is actually living the life and if not, who worries about it. At any rate the book put me to thinking and any book that puts people to thinking deserves to be passed on to our friends.

This space will be occupied by the author of "Extracts from a Superintendent's Diary," which ran in "Coal Age," June 20, 1914, to Aug. 26, 1916.

Mine Institute Discusses Coal Baking and Slope Belts

Education, Compensation and Administration Also Considered — Devolatilized Coal as Substitute for Anthracite — Short Shafts Not Justifiable

BY ALPHONSE F. BROSKY
Assistant Editor, *Coal Age*, Pittsburgh, Pa.

SLACK will be moved in a slow market by converting it into carbocite and selling that product in competition with anthracite, provided the plans of a large company in Illinois producing 5,000 tons of slack daily reach entire fruition, said R. D. Lamie, of Huntington, W. Va., in discussing low-temperature distillation at the meeting of the West Virginia Coal Mining Institute, held at Huntington, Dec. 4 and 5.

Mr. Lamie supplemented in his remarks the paper delivered in Clarksburg to the same organization June 13 and published in *Coal Age* Aug. 2, p. 171. After reviewing other processes of low-temperature distillation Mr. Lamie declared that carbocite seems destined to compete with domestic sizes of anthracite.

Asked by W. E. Fohl and Thomas F. Downing, Jr., whether coal of inferior quality could be satisfactorily used in the carbocite process, Mr. Lamie replied that coal that did not coke is better suited for low-temperature distillation, because gas escapes more readily from it as a result of its non-fluxing property.

Mr. Fohl had in mind coal from the Freeport seam and Mr. Downing bony coal. In reply, therefore, to the latter, Mr. Lamie declared that bony coal was of value for its volatile constituents but that these were not worth the cost of erecting a carbocite plant. He added that the cost of the plant would be greater for the same return in byproducts owing to the presence of the ash in the coal and declared that a 200-ton plant for carbonizing bone coal would cost as much as a 500-ton plant for the carbonization of good coal.

CLASSES BONE COAL WITH OIL SHALE

He recommended that inquiries be made into other methods of recovering gas from bony coal. The residue of bone coal, like that from oil shale, is valueless, for which reason the development of the oil-shale industry will be set back many years, especially if high-volatile coals, so much better suited to low-temperature distillation, are extensively subjected to that process and thus adequately supply the market. Carbocite, weight for weight, said Mr. Lamie, is worth as much as the coal from which it is derived, and then beyond that there is the value of the byproducts distilled from it.

Carbocite, if it is to be used for large steam-plant purposes, undoubtedly should be pulverized and fed into the boiler furnace in the same manner as raw pulverized coal. It can be made into briquets, the process adding $1.50 a ton to its cost. Mr. Lamie was not ready to say whether carbocite would compete satisfactorily with oil for steam purposes. Oil is purchased cheaply along the Atlantic and Pacific coasts and in the Southwest but is more expensive in the Middle West.

Adam Crawford in a paper discussed "Safety Organization and Administration," which served to introduce the problem of what should be done with the surplus in the State Compensation Fund.

Mr. Crawford is of the opinion that a portion of the fund should be devoted to the education of miners in

extension schools. Dr. J. J. Rutledge, chief mining engineer of the Maryland Bureau of Mines, thought favorably of the suggestion, for there is no other convenient way of raising money for this purpose. Colonel Downing objected emphatically on the ground that the fund could be used more profitably for the lowering of insurance rates. Diplomatically, Walter Cunningham, of Charleston, smoothed matters by saying, "Let the surplus fund grow." Later the Compensation Commission of the state can lower rates or lend a portion of it to mine owners who are willing to use it for bettering safety conditions at the time; or better still, it can be used for educating miners, thereby increasing their efficiency and decreasing accidents.

It devolved upon R. F. Carson, consulting engineer, of Huntington, to fill the chair of President A. C. Callen, who could not attend because of illness in his family. The chairman, consequently, read the president's address. Because of the meager attendance at the beginning of the morning session, C. B. Snow, president of the Huntington Chamber of Commerce delayed his address of welcome till the opening of the afternoon session, when an address on "The Limitations and Eccentricities of the Beckley Seam" was delivered by C. R. Stahl, who is assistant general manager of the E. E. White Coal Co. of Stotesbury, W. Va. No one present was sufficiently conversant with the Beckley seam to undertake to discuss this paper.

No Justification for a Shallow Shaft

The institute then turned its attention to a paper on "Belt Conveyors and Their Applications for Hoisting from Shallow Seams," presented by Alphonse F. Brosky, assistant editor of *Coal Age*. J. H. Edwards, electrical engineer of the Elkhorn Piney Coal Co., substantiated the statements in the paper relating to the power consumed in hoisting by a slope conveyor. He wondered why a shaft and not a slope was sunk in the shallow cover of a certain Logan County mine, which is 90 ft. deep. From it a 250-hp. hoist raises daily in cages about 1,100 tons of coal. At another mine of the same company, three-quarters of a mile away, where the conditions are exactly the same as at the shaft mine and the same tonnage is produced, a 25-deg. pan conveyor is operating, driven by a 75-hp. motor. Because both these mines are metered the company is in a position to compare relative power consumptions. The shaft mine consumes 1 kw.-hr. in hoisting 3½ tons of coal and the slope mine for the same expenditure of energy hoists 4½ tons, a saving of 22 per cent in power at the slope mine.

William Venable said that a scraper conveyor sometimes is better suited for hoisting purposes than a belt conveyor. Mr. Brosky remarked in reply that the friction between the moving parts and the coal on the pan of the conveyor militated against the efficiency of such equipment. Mr. Venable added that a scraper conveyor was preferable where the distance the coal had to be lifted was short and the slope was steep. As the friction depended on the cosine of the angle of slope, the steep scraper conveyor operated with minimum friction. He referred to an installation in a coal storage yard at Charleston which required only a small motor to lift the coal to a height of about 70 ft., the conveyor in that plant being short and steep. Mr. Brosky related the experiences of the Valley Camp Coal Co. at its No. 1 mine, near Pittsburgh, Pa. There a scraper conveyor is used for hoisting coal up a slope. The company finds that this conveyor is less efficient than the pan conveyor installed at its Kinloch mine. Seeing that the latter approaches most nearly to the belt conveyor of all those made of metal the efficiency of conveyance by belts is suggested if not proved.

When asked by Mr. Fohl how the cost of slope equipment compares with that of shaft equipment at a proposed mine of the Hudson Coal Co. near Morgantown, Mr. Brosky said that the former figured considerably less than shaft equipment, though the cost of sinking favored the shaft. However, the advantages derived by the use of a slope would give it preference even if the total first cost were more. The proposed mine is to yield 4,000 tons of coal per day from the Sewickley seam which lies at a depth of 275 ft. The slope was chosen in preference to a shaft with 10-ton skips.

Travels 95 Miles to Mining School

In a paper on "Progress of Extension Schools in Mining Communities of Maryland," Dr. Rutledge noted the eagerness with which miners attend classes and the hardships they sometimes endure in so doing. One man travels 95 miles once a week to attend night school, stays over night and returns the following day. His attendance has been 100 per cent since the extension courses were started. When Dr. Rutledge claimed the record for the largest weekly attendance at an extension class in the country, Mr. Crawford, of West Virginia University, claimed a superior record in a single attendance of 104 at a class in Kilsythe, W. Va.

R. J. Stanton, president of the mining institute of the Logan County Coal Corporation at Lundale, W. Va., described the meetings of his organization and the benefits derived from it. All those who desire to learn, from the president of the corporation down to the miner, are admitted to the classes and join freely in discussions of problems arising at the mines of the corporation. Papers are prepared and delivered by various members and outsiders. Prominent speakers often are obtained. He said that F. R. Wadleigh, formerly Federal Fuel Distributor of Washington, D. C., would speak to this institute on Dec. 8. Money shares are sold to the members on a time-payment basis at the rate of five dollars per share per month. The money is invested in secure bonds which pay 6 to 7 per cent interest. This is distributed to the accounts of holders of shares. The institute buys one $1,000 bond each month, from 200 payments of $5 each.

"Training Future Coal-Mine Executives" tied technical with practical training and showed how the combination can best be obtained. This paper was delivered by Charles E. Lawall, assistant professor of mine engineering at West Virginia University.

Dean E. A. Holbrook, of Pennsylvania State College, read a paper on "Mine Safety Conditions in the United States," which summarized the work of his committee in investigating this phase of mine operation for the Coal Commission.

The concluding paper was "Factors in Management," by Bill McCoy, of Pittsburgh, who pointed out three requisites for successful management, namely, competency, executive ability and personality. His paper dealt chiefly with the psychology of management.

Institute officers and committees for the ensuing year are: President, J. W. Reed, of Fairmont; Vice Presidents, Thomas F. Downing, Jr., C. C. Morfit, J. R. Cameron, P. C. Thomas and W. H. Cunningham; executive committee, Frank Haas, W. E. Fohl, R. M. Lambie and Edward Knight; Secretary-Treasurer, R. E. Sherwood.

Pinchot Proposes Anthracite Control By Federal Commission

Explains Contemplated Measure to "Progressive" Senators—Borah Evinces Deep Interest—After Lengthy Conference with the Governor Senator Pepper Approves Measure

Governor Pinchot, of Pennsylvania, has outlined a bill providing for federal regulation of the anthracite industry through a coal division of the Interstate Commerce Commission. The Governor spent last Friday in Washington explaining the proposed measure to "progressive" Senators, asking them to study it and lend their support with whatever changes may be necessary to increase its effectiveness. Senator Borah seemed especially interested in the bill and expects to introduce it, but with considerable modification.

On his return to Harrisburg, Friday evening, the Governor mailed a synopsis of the measure to the governors of thirty anthracite-consuming states. The proposed Coal Division would work in co-operation with the police powers of the anthracite-consuming states, which would be pooled according to the provisions of the proposed compact of states, a draft of which Governor Pinchot has already sent to the other Governors. Those two measures combined form the Pinchot plan, which will form the basis of the discussion at the second of the coal conferences to be held at Harrisburg Dec. 13 by the representatives of the states interested.

The Coal Division, as proposed, would consist of three members to be appointed by the President, not more than two of whom should be of the same political party. Each commissioner would receive $10,000 a year and his term would be for seven years.

Governor Pinchot and Senator Pepper of Pennsylvania held a protracted conference on Saturday in the latter's office going over the whole situation involved in the governor's proposed bill. After the conference it was announced from Senator Pepper's office that the Senator would be willing to introduce the bill, that he approved of it in a general way and that he would at least sponsor legislation along the general lines of the proposed bill. It was also stated, however, that nothing would be done until the conference of Governors, called for Dec. 13, is held.

Pinchot Outlines Anthracite-Regulation Measure

In a statement issued Dec. 7 Governor Pinchot said that the bill to regulate the anthracite industry should embody these provisions:

1. (*a*) *It should provide for the broadest possible control of anthracite in interstate commerce by a federal commission.*

(*b*) *Such a commission should probably be constituted a coal division of the Interstate Commerce Commission, composed of three members.*

(*c*) *The coal division should act not as an administrative court but as a board proceeding upon its own initiative to investigate and regulate the industry.*

(*d*) *The Coal Division should serve with the Interstate Commerce Commission when coal transportation rates, distribution of coal cars or regulations of carriers affecting the coal industry are under consideration, but otherwise have no jurisdiction over carriers' rates.*

(*e*) *The Interstate Commerce Commission should have no jurisdiction to review an order or recommendation of the Coal Division.*

2. *The act should declare it unlawful for those engaged in the production and distribution of anthracite in interstate commerce to use unfair practices, to charge unreasonable prices, to create monopolies in or restrain interstate commerce in coal, or to engage in any practice, not in interstate commerce, which causes any unreasonable discrimination against interstate commerce in coal.*

3. *The act should give the Coal Division the broadest possible powers:*

(*a*) *To investigate and publish the facts in relation to anthracite coal affecting interstate commerce.*

(*b*) *To make recommendations on any subject connected with the anthracite industry.*

4. (*a*) *The act should authorize the Coal Division to issue mandatory orders for compliance with its recommendations when the public interest requires.*

(*b*) *Such orders should be issued only after opportunity for a hearing.*

(*c*) *Mandatory orders as to wages or conditions of employment should be prohibited.*

(*d*) *In order to meet constitutional objections the right to fight the price of coal, etc., by mandatory order should be limited to cases where, in the absence of regulation, there exist, or is danger of exorbitant charges and arbitrary control.*

5. (*a*) *Provision should be made for appeals from orders of the Coal Division to the U. S. Circuit Courts of Appeals, as in the case of appeals from the Federal Trade Commission.*

(*b*) *Orders unappealed from or affirmed on appeal should be final. They should be enforceable by injunction and through the imposition of penalties.*

6. *Penalties should be provided similar to those in the Packers and Stockyards act of 1921.*

Nine Men Killed by Explosion In Wet, Non-Gaseous Mine

An explosion, thought to have been caused by coal dust, occurred at 4:45 p.m., Dec. 7, 700 ft. from the mouth of the Blackhawk Coal Co.'s mine at Happy, Carr's Fork, Perry County, in the Hazard field of eastern Kentucky. It resulted in the death of seven men and in injuring six, two of the injured dying later and the other four being reported in a serious condition.

A report from Hazard, Ky., stated that there were but thirteen men in the mine, which employs about 100 workers. The rest of the crew had quit for the day promptly at 4 p.m. A faulty or windy shot is believed to have ignited the dust, although it will be difficult to determine the actual cause, as most of those who might know what happened are dead or seriously injured.

The mine is wet as compared with others in the same region, only a small portion of the workings being dry. This makes it difficult to understand how the accident occurred. So far as known it is the first severe explosion the Hazard field has ever experienced, for the coal measures are not gassy. There have been a few men injured or killed from time to time from faulty shots, but the mine officials in general believe that the mines are too dry to be subject to dust explosions.

Reports from Hazard state that the force of the explosion wrecked the office located at the mouth of the mine and, according to some reports, stopped the fans, but it is not clear that they were running when the explosion occurred. John Lewis, Foreman Mullins and others on the outside of the mine quickly formed a rescue party, started the fans and followed fresh air into the mine, finding seven men dead on the floor near one another. Death apparently was instantaneous. The six injured were found near the group of dead.

The mine is a comparatively new one. It was formerly known as the Perciful Gorman Coal Co. and was reorganized about a year ago as the Black Hawk Coal Co. at a time when Kenneth U. Meguire, of the Harlan Coal Co., Louisville, and associates became interested in it. Mr. Meguire is president, and he and Gorman are the principal owners. Mr. Gorman is an experienced mine manager, and some years ago led the rescue party in a bad Tennessee mine disaster.

President Coolidge's Recommendations on Coal In First Message to Congress

The cost of coal has become unbearably high. It places a great burden on our industrial and domestic life. The public welfare requires a reduction in the price of fuel. With the enormous deposits in existence, failure of supply ought not to be tolerated. Those responsible for the conditions in this industry should undertake its reform and free it from any charge of profiteering.

The report of the Coal Commission will be before the Congress. It comprises all the facts. It represents the mature deliberations and conclusions of the best talent and experience that ever made a national survey of the production and distribution of fuel. I do not favor Government ownership or operation of coal mines. The need is for action under private ownership that will secure greater continuity of production and greater public protection. The Federal Government probably has no peace-time authority to regulate wages, prices, or profits in coal at the mines or among dealers, but by ascertaining and publishing facts it can exercise great influence.

The source of the difficulty in the bituminous coal fields is the intermittence of operation which causes great waste of both capital and labor. That part of the report dealing with this problem has much significance, and is suggestive of necessary remedies. By amending the car rules, by encouraging greater unity of ownership, and possibly by permitting common selling agents for limited districts on condition that they accept adequate regulations and guarantee that competition between districts be unlimited, distribution, storage, and continuity ought to be improved.

The supply of coal must be constant. In case of its prospective interruption, the President should have authority to appoint a commission empowered to deal with whatever emergency situation might arise, to aid conciliation and voluntary arbitration, to adjust any existing or threatened controversy between the employer and the employee when collective bargaining fails, and by controlling distribution to prevent profiteering in this vital necessity. This legislation is exceedingly urgent, and essential to the exercise of national authority for the protection of the people. Those who undertake the responsibility of management or employment in this industry do so with the full knowledge that the public interest is paramount, and that to fail through any motive of selfishness in its service is such a betrayal of duty as warrants uncompromising action by the Government.

Does Coolidge Message Mean Regulation, Fact Finding or Voluntary Returns?

Coal Sections Considered Vague—President Doubtful Whether Government Has Power to Fix Prices, Wages and Profits Except in Extreme Emergency—Coal Not to Be Major Issue

BY PAUL WOOTON
Washington Correspondent of *Coal Age*

In so far as it deals with coal, the President's message is ambiguous. It gives the impression that he is not in favor of regulation except during extreme emergency, but there appears to be great difference of opinion as to the significance of what he said. It indicates that he is doubtful whether the federal government has any power to fix prices, wages or profits, or take similar action in peace times. He does make the clear-cut statement that he does not believe in government ownership. This statement could have been little more than a gesture, since hardly anyone believes in it, and certainly there had been no doubt as to Mr. Coolidge's position.

The message has failed to clear the air. So far as coal is concerned, a state of doubt, of hesitancy and of expectation has existed for three months. There have been rumors of drastic federal action. Then came Governor Pinchot's plan for drastic regulation through the states. In addition there were the pending recommendations of the Harding Coal Commission providing a mild form of regulation. Only a few days ago Senator Smoot, one of the mainsprings of the majority party, pointed to the Coal Commission's findings as justification for his belief that large profits are enjoyed by the coal industry. Some took it to indicate that justification was being provided for an administration effort to bring about regulation.

Within the coal industry there have been two views as to the best plan of procedure. Some, convinced that a storm is coming, urged that a point be conceded and that voluntary returns be made in the hope that this would head off something even less desirable. The other view was to surrender nothing and be ready to take issue with the federal government at any time so as to determine once for all the exact extent of federal authority.

In such a situation as this it had been hoped that some of the uncertainty, at least, would be removed by the presidential message. Through the mist which surrounds the President's utterance on coal one can discern certain familiar forms, such as intermittency, storage and car rules, but the label on the exhibit cannot be made out, so it still is uncertain whether they spell regulation, compulsory fact finding, or voluntary returns.

There is one very certain deduction that can be made. That is that the administration is not disposed to make coal a major issue. The message certainly strengthens the position of those within the industry who are opposing voluntary reporting. There can be no doubt that the principal pressure in favor of voluntary reports has come from the fear that it was either that or something worse. Now that pressure is much relieved.

It is apparent that the President is not disposed to make a great fight that would have as its object the regulation of the coal industry. Without his influence, those who may have in mind some such plan are certain to recognize that any chance they may have had for success has been weakened greatly. It is known, however, that legislation will be introduced covering all recommendations of the Coal Commission. It is believed that the President would approve of such a measure, but in view of this message, he evidently is of the opinion that Congress has the facts and can decide for itself whether or not legislation presents the best method of dealing with the situation in coal. In this connection, it is of interest that Secretary Hoover, on the day preceding the delivery of the President's message to Congress, indicated in a public address that he had no great faith in the effectiveness of coal legislation at this time.

Three Drown When Water Floods Illinois Mine

The spectacular flooding of the Radium mine of the Aluminum Ore Co. of America, at Belleville, Ill., drowned three men Dec. 6 and gave most of the other 250 men in the mine a race for their lives. The water broke into the mine when an entry was driven too close to an adjoining water-filled, abandoned working. The face broke through and the water rushed in together with a considerable volume of gas. Louis Ambruster, William Lescher and John Evans, all of Belleville, were drowned. Six others were gassed but were carried out and have recovered. Herman Isler, a foreman, won public praise by holding open a door on No. 5 entry in which the break occurred, until all the forty-eight men in that entry except the three, were out.

Midwest Operators Favorably Impressed With Coolidge Message on Coal

Recommendations to Reduce Overhead Costs Strike Responsive Chord—Continuity of Operation the Paramount Object—Self-Reform Favored—Removal of Sherman Law Restrictions Necessary

Middle Western coal operators who do a good deal of the thinking for their sections of the industry are ready to admit, almost to a man, that the President's message on coal was an honest and from-the-shoulder document. It said about all a President could be expected to say, with the information that he has at hand. It is evident from their statements to *Coal Age*, however, that they are not looking to President Coolidge for any Moses-like leadership from the coal wilderness.

Dr. F. C. Honnold, of the Honnold Coal Bureau, Chicago, said: "It is notable that the President favors 'greater unity of ownership' and the establishment of common selling agencies, both of which seem to promise some reduction in overhead costs, both in administration of mines and in sales cost. Nothing, however, according to his apparent conviction, even approximates the importance of the continuity of mine operation and the removal of recurrent strikes. And in this particular his viewpoint meets exactly the ideas of the coal-mine operators, but of late years no way has been found to prevent the mine workers' union from ordering discontinuance of work if and when the demands of union leaders were not met.

"It is evident that the President is still hopeful and believes that a commission appointed and properly empowered by the government would be able to conciliate and obtain voluntary arbitration and to adjust any threatened controversy between mine owners and their employees. It is extremely difficult for the operators to understand how such a hope can be justified upon the basis of the experience of the last three years.

"The President's remark that the failure of either management or employees to recognize the public interest or to fail, through any motive of selfishness, to render service constitutes a betrayal of duty and warrants uncompromising action by the government, seems in view of experience, to be a rather vague declaration."

J. B. Pauley, vice-president and general manager of the J. K. Dering Coal Co., Chicago, said: "The President's message is unique and refreshing. It bears the stamp of an honest statement by an honest man, without consideration of political features or personal effect. With that portion which refers specifically to the coal industry there is little opportunity for disagreement, generally speaking.

"The facts about coal are well known. The remedies are not so simple. Many intelligent coal operators, who have spent a life time in the business, would find it difficult to prescribe such remedies; hence the President could not be expected to do it, knowing the main facts as he does. The laws and Constitution would prevent the application of the natural remedies which would occur to the President, or anyone else, in attempting to solve this complicated problem, but in spite of all this, the message, as it refers to coal, carries a constructive undertone.

"The statement that 'those responsible for the conditions in the industry should undertake its reform' is encouraging and salvation could probably be worked out along these lines, with proper encouragement from the government, without any great prejudice to those involved, if it were possible to eliminate consideration of the political effect, which, unfortunately, is usually held to be of paramount importance."

W. K. Kavanaugh, president of the Southern Coal, Coke & Mining Co., St. Louis, thinks "the President's message is all right, considering the light he has upon the subject. I was particularly interested in his reference to necessary remedies which would encourage greater unity of ownership. The need for conservation in this great basic industry should be made clear to Congress so that possibly it might see the importance of removing the Sherman anti-trust law restrictions as applied to coal."

Dr. C. H. Krause, St. Louis, president of the Fifth and Ninth Districts Coal Operators' Association, declares: "Coal men in Illinois realize and recognize their responsibility to the public as producers of one of the essential commodities; also their responsibility as employers of a large body of American citizens. They see in the President's message an understanding and official recognition of the community of interest between the various elements of industry and a disposition to fairness that should result in the coal industry's working out its own problems equitably."

According to W. L. A. Johnson, Kansas City, commissioner of the Southwest Interstate Coal Operator's Association, "the President's message on coal is a clean-cut, logical statement on the proper solution of the present deplorable condition of the coal industry. If it is crystalized into unbiased legislation in the interest of all factors concerned, it should go far to remedy many existing evils. Operators generally will co-operate with Congress to obtain proper legislation but will resist partisan or unfair legislation that seeks to stifle private enterprise or free and untrammeled management of industry within the limits of constitutional law."

State Treasurer Would Abolish Anthracite Tax

Charles A. Snyder, State Treasurer of Pennsylvania, issued a statement last week relative to the collections for the year ending Nov. 30, 1923, during which period $64,200,917.44 was received. This sum was $8,000,000 in excess of the moneys collected for the fiscal year ending Nov. 30, 1922.

Because of this increase, the Treasurer pointed out there is no necessity for the continuance of the anthracite tax or the net profits tax laws on the statutes. The sum of $62,000,000 of that collected, he said, came from old revenue-producing laws passed prior to 1917, and these laws, if the Auditor General is given additional powers, can produce $65,000,000 or more a year.

"The State Treasurer contends," the statement read, "that the profits tax and the coal tax should be abolished at the next session of the Legislature, and added powers given to the Auditor General for the closer inspection and investigation of taxes due under old laws."

Rail Coal Consumption Falls Slightly in September

Class 1 railroads of the United States consumed 8,521,000 net tons of coal during September, 1923, as charged to account 394, compared with 8,529,000 tons in the preceding month and 7,856,000 in September, 1922, according to a report by the Bureau of Statistics of the Interstate Commerce Commission covering 176 steam roads. During the first nine months of 1923 these roads consumed 82,299,000 tons as compared with 51,736,000 tons in the corresponding period of 1922. The delivered cost per ton in September last was $3.31; in September, 1922, it was $4.83.

Consumption of fuel oil during September was 175,943,000 gallons, compared with 168,868,000 gallons in August and 138,232,000 gallons in September, 1922.

Coal Legislation Hopper

Representative Rogers, of Massachusetts, has introduced a bill in Congress which provides that whenever the President shall find that the public interest requires it, he is authorized to declare an embargo on the exportation of coal to foreign countries, such order to include either anthracite or bituminous coal or both.

Senator Borah, of Idaho, is working on two coal bills, as a result of an exhaustive study of the Coal Commission's reports and recommendations.

A bill setting standards of preparation for domestic coal has been introduced in the House by **Representative Luce**, of Massachusetts. The bill requires certificates attached to bills of lading declaring that shipments conform to one of the standards provided for. Penalties are provided for making false statements.

It is understood that the **LaFollette "radical" bloc** is considering some coal legislation but is not yet prepared to announce its purpose.

Union Organizing Under Cover Puzzles Harlan and Hazard Fields

Sudden Walkout When Notice of Proposed Wage Cut Is Posted Causes Speculation on Extent of Union Influx—Operators Receive Mysterious Letters

How great has been the infiltration of United Mine Workers into the open-shop mines of the Harlan fields of southeastern Kentucky? That is the big question that has been disturbing Kentucky coal circles in the neighborhood of Cincinnati during the past week or ten days.

Keyed in with this is the problem of whether the mines having a union agreement will attempt to throw this off. On Nov. 10 the officers of District 19 of the United Mine Workers named Nov. 26 and Harlan Ky., as the date and place of a meeting to work out an agreement for the Harlan field. No notice was served on the union people. On Dec. 5 a letter was directed to R. C. Tway, president of the Harlan Coal Operators' Association, in which the statement is made: "Common courtesy warrants you to at least answer our communication. . . . We say to you that any industrial conflict that may take place in the Harlan coal field you, gentlemen, will be directly responsible for." Those interested in Harlan operations with offices here in discussing the situation, say that it remains *in statu quo*.

The extent of the influx of unionists into open-shop mines was shown in a peculiar manner last week. Facing losses through low prices a large operator posted notice of a 20 per cent horizontal cut in wages. The next day all of the men flashed union buttons on him—and walked out. He had no reason to suppose that his mine had been "organized."

Evidence of further trouble comes from a mysterious hand-written letter posted on a Louisville & Nashville train and addressed to several operating companies with headquarters in Cincinnati as well as to operating headquarters in the Hazard fields, in which it was stated that "it would be best for all of the Hazard mines to close until Jan. 1 and avoid trouble."

General earmarks such as these would indicate that the southeastern fields are in a foment such as they went through when the last effort to implant unionism was made there four or five years ago.

Cave-in at Jessup, Pa., Traps Five; All Believed Dead

Five men, including Evan Jones, the mine foreman, are crushed to death or entombed in the Mount Jessup mine of the Mount Jessup Coal Co., Jessup, Pa., as a result of cave which occurred Dec. 8. All efforts to get into communication with the men have failed and virtually all hope of finding them alive has been abandoned by the rescuers.

Mine Foreman Jones lost his life in trying to save the lives of his workmen, according to the stories told by some of the workmen who escaped death. He had gone into the mine to inspect some work, when he thought he heard the sound of sliding rock and began ordering workmen outside. He told the retreating miners that he was going to other sections of the vein to warn four other workmen, and despite their protests, went. At about the time the mine foreman would have reached the part in which the four men were working the roof collapsed. Hope was entertained for a time that Jones and the four men had escaped by way of the Sterrick Creek shaft.

Gangs of workmen under the direction of mine inspectors and officials are working in relays to remove the débris from the area affected, which is about 150 ft. square.

Two of the missing men are said to have been engaged in the work of robbing pillars when the cave occurred.

Mechanical Engineers Study Coal Storage

Coal-storage problems were discussed at the session of the Material Handling Division of the American Society of Mechanical Engineers, which held its annual meeting in New York City from Dec. 3 to Dec. 6, the morning of Dec. 5 being devoted to these problems.

In describing various coal-storage systems, H. E. Birch and H. V. Coe stated that the amount of coal in storage depends on the distance from source of supply, adequacy of rail and water connections, the seriousness of a possible shutdown, the probable future growth of the plant, and other local considerations which must be weighed separately for the plant in question.

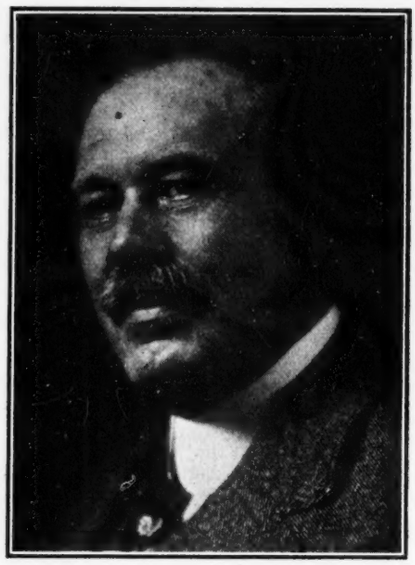
In his paper on "Factors in the Spontaneous Combustion of Coal," O. P. Hood, chief mechanical engineer, U. S. Bureau of Mines, said that in order that the engineer may intelligently consider the phenomena of spontaneous combustion of coal he must have some general ideas about the coal substance, the character of coal surface, the atmosphere in which it may be immersed and about slow combustion.

A paper on "Economic Phases of Coal Storage," by F. C. Tryon and W. F. McKenney, of the Geological Survey, embodied the results of a study made by the coal-storage committee of the Federated American Engineering Societies pointing to the economic advantages of coal storage.

William L. Connell Dies

William L. Connell, member of the Anthracite Board of Conciliation since its organization in 1902, and one of the prominent hard-coal operators, died at his home in Scranton, Dec. 10. He was born in Minooka, Pa., Oct. 14, 1862. Mr. Connell, who was twice Mayor of Scranton, returned to business last spring after a seven months' illness apparently in good health and attended a meeting of the Conciliation Board on Dec. 7, when the Hudson Coal Co. situation was under consideration.

In 1891 he organized and managed the Enterprise Coal Co., which has been in operation since and which has its mines near Shamokin, Pa. Later he became president and general manager of the Green Ridge Coal Co., and later he headed the Connell Anthracite Mining Co. and the Lackawanna Coal &



WILLIAM L. CONNELL

Lumber Co. During his service as a member of the Board of Conciliation Mr. Connell was the representative of the independent operators.

His part as a leader in the anthracite industry was first officially recognized by Governor John K. Tener, when the latter appointed him to the mine-cave commission in 1911. Again in 1920, when the presidential wage commission was named by President Wilson, he was chosen to represent the producers.

In 1893 he began his first term as Mayor of Scranton, serving until 1896. Six years later he was again named to the office of the city's chief magistrate, remaining in office until 1906. In politics he was always a Republican.

Aside from his interest in coal he was a prominent figure in other fields of industry. He was a director in the Scranton Life Insurance Co., the International Textbook Co. and the International Publishing Co. He was at one time a director of the Union National Bank. He was also identified with the Paint Creek Collieries Co.

W. W. Inglis, president of the Glen Alden Coal Co., succeeds Mr. Connell as chairman of the Conciliation Board.

Trade Commission's Usefulness at End, Conduct of Madeira-Hill Case Proves

Methods Savor of Persecution—Strays from Economic to Judicial Activities—Fails to Profit by Legal Setbacks—Bill Introduced for Its Abolition

Further evidence that the Federal Trade Commission has outlived its usefulness and has become hopelessly actuated by a spirit of persecution is seen in its conduct of the Madeira-Hill hearing. The tactics resorted to by the counsel for the commission in obtaining certain material for its record is alleged to have approached false pretense.

The Federal Trade Commission in September was told by the President to look into the matter of wholesale and retail prices of anthracite. Thereupon representatives of the Federal Trade Commission waited upon the Harding Coal Commission and asked permission to examine reports on wholesale and retail costs, which had been obtained under the powers vested in the Coal Commission. The request was granted in a letter embodying a formal resolution of the Coal Commission which stated clearly the terms under which the material could be used. Those terms do not authorize the presentation of these papers as evidence in a legal proceeding. Regardless of that, the original returns from some of the companies were incorporated into the record as evidence.

Letters Unfairly Obtained

Certain letters written by Mr. Madeira to Dr. George Otis Smith were obtained on what is declared to be misleading representations. Dr. Smith was told these letters had been referred to in the Madeira reply to the Federal Trade Commission; Dr. Smith was given the impression that Mr. Madeira had thereby released them. An examination of the formal reply showed no reference to the letters written Chairman Hammond and Dr. Smith.

The letters would not have been made available had the situation been accurately stated. Counsel for the Federal Trade Commission would not allow Dr. Smith to explain the terms and purpose of the Coal Commission's resolution. The original returns were made a part of the record in the face of the clearly stated condition that the original documents must remain in the custody of the Secretary of the Interior, the custodian of the records of the commission. When Dr. Smith was on the stand, the Trade Commission's counsel in substance asked: "You seem to have some personal interest in this case." "I have," replied Dr. Smith; "As a private citizen and as a public servant trying to get at the truth."

There has been some criticism of the Harding Coal Commission because it recommended that federal supervision be vested in the Interstate Commerce Commission. There are some who would have had the recommendation read "Federal Trade Commission." The conduct of the Federal Trade Commission during this hearing leads many to believe that it is trying for a position in the sun, and makes it clearer that the Coal Commission made no mistake in its recommendation.

This proceeding has brought out with particular clearness the trend of the Federal Trade Commission away from economic activities and toward judicial functions. The trend has been gradual but as time has passed less and less of the Federal Trade Commission's appropriations have been absorbed by its economic work. It has reached a point where many believe it to be usurping the functions of the Department of Justice. It has moved away from Mr. Hurley's constructive conception of making the commission a tower of light to dispel the twilight zone created by the anti-trust statutes.

Missed Lesson in Maynard Case

Many are surprised that the commission did not profit by the Maynard case and other legal proceedings which have been brought successfully against it. Instead of indicating that it should be more constructive and less legalistic, these cases seem to have worked the other way. The commission was invited to look into the price of anthracite. This gave an unusual opportunity to be of constructive service. It could have done much toward allaying the feeling of panic which had overtaken buyers at that time. It could have called in the independent operators and probably could have worked out a voluntary arrangement which would have saved consumers large sums. Instead, the commission chose to marshal its whole resources in an effort to run down certain individual cases of alleged profiteering.

Would Abolish Trade Commission

This attitude on the part of the commission has resulted in the introduction of a bill by Representative Johnson, of Washington, proposing the abolition of the Federal Trade Commission and the transfer of its activities to the Department of Commerce. Mr. Johnson states that he has presented this legislation because of the failure of the commission to be constructive in its activities.

The decision in the Madeira-Hill case may be handed down Friday. There are many who think the very capable men who comprise the commission, on second thought, may take a stand against a clique within the commission's staff which would make it a muck-raking machine. P. W.

End Hard-Coal Rate Hearing; Early Decision Unlikely

The Interstate Commerce Commission on Dec. 8 practically concluded its hearing on anthracite rates and rates on anthracite substitutes. It is thought probable that the commission will call for briefs and will require oral argument. It is practically certain that a decision in the matter cannot be handed down in time to affect business in this coal year.

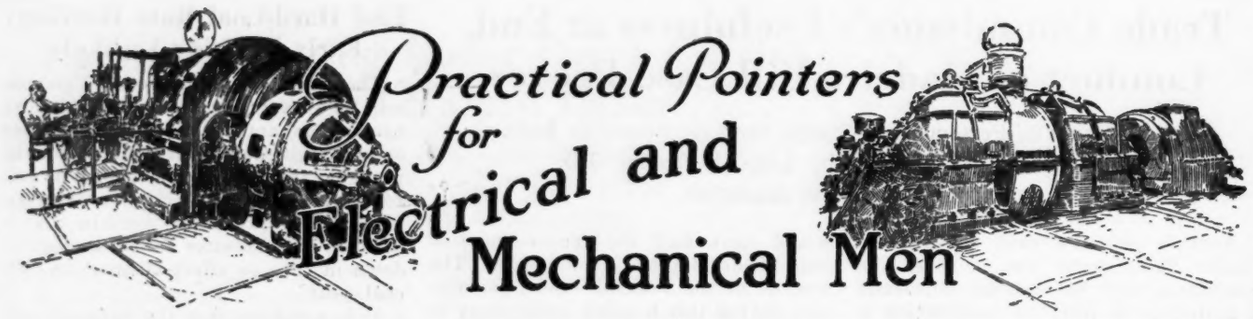
It is admitted that the railroads opposed convincingly the publication of rates from the smokeless fields. Apparently, they established that any all-rail rate to be low enough to move the coal would not be compensatory. If the rates were made high enough to be compensatory, no coal would be moved. Moreover, it was pointed out, 2,000 additional cars would be required to protect a movement of 100 cars per day. Any diversion of the New England movement from southern West Virginia via Hampton Roads would result in the further loss occasioned by idleness of expensive equipment at those ports. The point also was made that any such plan would be contrary to the recommendations of the Harding Coal Commission, which suggested a form of economic zoning to prevent long hauls. Attention also was called to the fact that the commission itself in broadening Ohio differentials had been influenced in part to reduce the haul.

With regard to anthracite proper, little evidence was introduced by consumers. It is possible that the commission will make changes on its own knowledge of the situation, but to attempt to fix rates without having evidence in the record would be an unsound basis for rate making, some contend.

Wholesalers Discuss Proposed Coal Legislation

The executive committee of the American Wholesale Coal Association will open a two-day session in the Whitehall Club, New York City, this morning, at which important matters relating to the wholesale phase of the coal industry and proposed legislation will be discussed. Invitations have been sent to every wholesale coal dealer in New York City and vicinity to attend the luncheon meeting at the club at one o'clock, at which time prominent speakers will discuss the work of the Federal Trade Commission, matters of legislation and that portion of President Coolidge's message relating to coal.

Efforts will be made during the sessions of the Executive Committee to interest the New York wholesale dealers in the work of the association and to point out to them their position with respect to the Federal Trade Commission. Charles L. Dering, of Chicago, president of the association, and Charles A. Owen, member of the Executive Committee from New York City, expect a large attendance.



Direct Determination of Volt Drop of Haulage Circuit

Much has been said and written about the importance of good track bonding on the haulage systems at the mines. Whenever there is a convention of any kind or get-together meeting of electrical men, almost invariably there is some discussion on the subject of bonding. The power losses, maintenance costs, delays and other disadvantages of poor bonding usually are well known to the average electrical engineer, electrician and mine superintendent, but few know just how bad or how good the bonding is in any of the mines.

Eternal vigilance is the motto of many electrical men and by continually following up on the bonding repairs wonderful results have been attained in maintenance of motors and train schedules, to say nothing of the saving in power and the lessened need for large generating and converting equipment to feed the direct-current supply lines.

Where bonding is poor, lines long, loads large and remote from the supply, conditions are the worst. Here it is first of all desirable to feed power into the center of the load or into localized load centers by placing the generating or converting equipment as near to the load as possible. Sometimes it will be found to be highly desirable to locate the supply station inside the mines or on the surface as directly as possible over the load center.

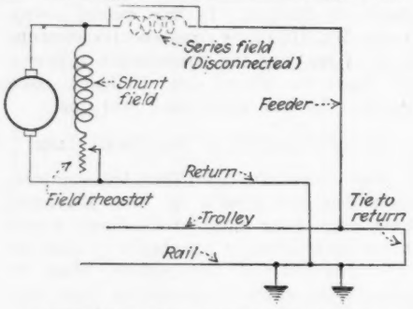
In localities where the coal is thin, and especially where one seam is mined at a time and the load center moves rapidly, a portable converting substation is highly desirable, because of the resulting power saving and flexibility as well as the economic and operating advantages which affect the ledger sheets and the whole personnel from the manager to the miner. We have become so set in the habit of permanently fixing these stations that our better sense of judgment seems to be somewhat tardy in asserting itself.

Another important feature is the shortening of all feeder and return circuits whenever an opportunity presents itself in the development of the electrical feeders and occasionally by a prearranged plan designed to better the whole power-transmission system.

Decision on the type of bond to be used frequently is a matter of track and haulage requirements. The advantages of good bonding are obvious.

Periodic bond testing is necessary on all important track systems but the real test of the circuit is the drop of voltage under load conditions. Bond testing will localize a fault in the track return, but the resistance of the circuit is dependent also upon the resistance of the feeder system, which often is neglected.

A simple test for determining the circuit resistance is to short-circuit a feeder line to the track and force current into the circuit from the generator. The generator should be operated as a shunt generator for the test and the voltage should be gradually built up from zero by control of the field rheostat. By taking instantaneous current and voltage readings at different loads an indication of the voltage drop in that part of the system is directly obtained. Such tests may be carried on in various parts of the mine and poorly bonded sections localized. Evidence thus obtained gives tangible proof of poor voltage conditions and can be used to advantage at conferences with superintendents, foremen and electricians.



TESTING FOR VOLTAGE DROP

With the generator connected as a shunt machine the voltage is built up in the closed circuit between the feeder and return to any desired load. The voltage necessary to force any given amount of current through the circuit is equal to the drop in that circuit when operated at that given load during normal operation.

Power-Plant Problem of the Coal-Mining Company

With reference to Mr. Butcher's letter which appeared in the Nov. 22 issue of *Coal Age* I wish to offer the following remarks:

The experience outlined in the letter referred to above is much the same as happens to most engineers entering the coal fields for the first time. The practices and types of installation seem almost criminal until a thorough study has been made of the various situations, after which there seems to be more or less justification for some of the situations that seem so bad at first glance. It must be remembered that a great many of the power installations in coal mines in the past have had little or no engineering, but just "grew," like "Topsy." The mine superintendents were largely selected for their knowledge of coal mining, with little thought to the power end of the situation. The result was that a great deal of the power equipment was purchased on the recommendation of the manufacturers, so that in many cases the equipment was not best suited to the needs of the mine.

Reason for Simple Engines

There is a fairly good reason why most isolated plants are equipped with simple automatic engines, running non-condensing. This is due to the fact that the type of experienced labor available around many of the mining communities is of a poor grade, and only the simplest kind of apparatus will give satisfactory service. It would be folly to install high-grade condensing equipment when the type of labor necessary to operate this equipment is not available.

In order to utilize the exhaust steam it is necessary to install low-pressure turbines and a complete condensing equipment. Even where water is available, this requires a much higher grade of labor than is necessary for a simple non-condensing engine. In addition, this requires a considerable layout and in many cases there is no place to utilize the additional power generated.

Water Supply Is Important

In answer to the question, "Can a public utility sell power for less than it can be made for using waste steam at the mine?", it has been amply proved that in the large majority of cases power can be purchased at an equal or lower rate than it can be made by a mining company. This is proved by the fact that a large number of mines have changed over to central-station power during the last ten years, and with scarcely a single exception, the power is costing the mining company less than it did before, and in a large majority of the cases the mining company would not for a minute consider going back to the making of its own power. One of the principal reasons for this is that the most important essential for satisfactory power production is a plentiful supply of good water.

It is rather rare that a good supply of water is available in the mining sections. The poor water usually available requires water-treating plants, which, in turn, require a fairly high-grade type of labor to keep the water-treating plant in successful operation.

A coal-mining company is in business essentially to produce and market coal, and the generation of power is more or less foreign and requires considerable technical ability, which does not exist in the average coal-mining organization. For this reason power is not generated under the best conditions and at as low a price as it should be. Coal-mining companies, like industrial organizations, have a limited amount of capital, and they can employ this capital at much better advantage in the development and operation of the coal mine than they can in the installation of a power plant. When a power plant becomes overloaded it frequently is necessary to install new boilers as well as new engines and generators. This requires a considerable outlay of capital, which the average coal mine cannot easily obtain. With central-station power the increase in capacity can be obtained at low expense and in very much less time than would be the case with an isolated power plant.

BETTER BOILER-ROOM PRACTICE

The older boilers around coal mines usually were of the fire-tube type, while the most recent installations are putting in the water-tube type of boiler. The installation of stokers depends somewhat on the type of fuel and the saving in labor that would be obtained by their use.

It must be remembered that a large number of the coal mines were purchased by the present operators, who are not responsible for the type of power equipment that existed when they purchased the property. A large number of operators realize that their equipment is not what it should be, but they would have considerable trouble in persuading a board of directors to expend considerable sums in bringing the plant up to date. During the next two or three years the competition in the coal business is going to be very keen, and a number of the inefficient coal-mining plants will be compelled to shut down. The coal companies that expect to stay in business will have to be sure that their power plants and their entire mining equipment is operated in a most efficient manner, and where engineering ability does not exist in the coal-mining companies it should be employed from outside sources, if the coal companies expect to keep in business at a profit.

EACH MINE A DIFFERENT PROBLEM

It should be remembered that no two coal-mining problems are alike; in fact, there is a vast difference in the conditions that exist in different mining sections. No general recommendation can be made in regard to the type of power plant and whether central-station power should be used or not, since each mining problem should be analyzed thoroughly before any recommendations can be made. In general it is safe to say that purchased power should be utilized whenever available, and where not available, if the mine is small, a simple automatic non-condensing engine or non-condensing turbine should be used in generating power. For the larger mine it will often pay to put in condensing equipment where high efficiency can be made to pay. The conditions in the average isolated power plant in coal mines are very much as pictured, and the only way to remedy these defects is to employ intelligent engineering toward revamping the plants and introducing more efficient methods of generating and utilizing power.

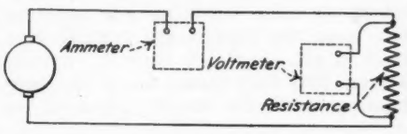
GRAHAM BRIGHT.

Howard N. Eavenson & Associates,
Pittsburgh, Pa.

Resistance of Electrical Circuits

The ohm, the unit of resistance, usually is calculated for a given circuit or part of a circuit. There is a definite relationship between the voltage, current and resistance of a circuit. This relationship has been stated in a law known as Ohm's Law. To get an understanding of how the volts, amperes and ohms are related, we must again refer to our water analogy. First of all, if we have a pipe line and we wish to force water through it, we must have pressure. This pressure is similar to voltage; the flow of water is similar to the current in the electrical circuit.

The resistance of the pipe to the flow of water is similar to the resistance of a conductor to the flow of electrical current. In electricity this resistance is measured in ohms. Obviously, if we have a certain pressure and desire a certain flow of water to pass through a pipe, if the pipe is small it offers a high resistance; in fact we may not be able to force our given amount of current through the pipe without increasing the pressure. By increasing the pressure to the required value, however, we can force the desired quantity of water through the pipe. If the pipe is large in diameter—that is offers little resistance to the flow of the water—the pressure necessary to force a given quantity of water through the pipe becomes small.



TAKING MEASUREMENTS FOR DETERMINING RESISTANCE

The value of the resistance is determined by taking voltage and current readings on the meters and solving by use of formula No. 3.

In electrical circuits the condition is quite similar. To force a given current through a conductor, the greater the resistance of the conductor, the greater will be the voltage to force the current through. Therefore a circuit having a low resistance will carry a heavy current and will require a low electrical pressure, while a high-resistance circuit will require a high pressure even to force a small current through the circuit. Ohm's Law establishes the relationship between the volt, ampere and ohm, and may be stated thus: The current flowing in a given circuit is equal to the voltage divided by the resistance. This same formula may be expressed in two other different ways; namely, the voltage equals the resistance times the current and the resistance equals the voltage divided by the current.

Using the following letters, this formula may be represented as shown:

I represents current in amperes;
E represents pressure in volts;
R represents resistance in ohms.
Then

$$(1)\ I = \frac{E}{R};$$

$$(2)\ E = R \times I;$$

$$(3)\ R = \frac{E}{I}.$$

Saving the Centrifugal Pump Motor

A few weeks ago our company had a rather interesting experience with the operation of a centrifugal pump. Unfortunately, however, the experience came when we did not have much time to spare.

The pump referred to is a large 1,000-gallon-per-minute 400-ft. head centrifugal pump. For years this pump and its driving motor had been working without any great amount of repair and maintenance cost; in fact it was almost automatic in that constant attendance rarely was required.

This pump has always been operated against a static head of about 360 ft.; the friction in the pipe line probably is nearly equal to 40 ft., and therefore the pump and motor has been working at full capacity.

One day when everything seemed to be going fine a fire developed in one of the levels above this pump and it became necessary to tap the column line of the pump to supply water to the fire region.

The motor on the pump was running at normal load until the valves supplying the fire lines were opened. Soon after the water in the fire lines began to flow, the motor became overloaded and the pump man did not know what to do. The pump could not be shut down, so he left it operating but called one of our engineers.

When the engineer arrived the motor was becoming quite hot, but instead of shutting it down the valves on the fire lines were partly closed. The result was that these valves introduced sufficient friction in the lines to make the discharge pressure on the pump about equal to normal when operating on its usual column line and the motor load came back to a point within its capacity.

ELECTRICIAN.

Problems In Underground Management

Means for Extension and Removal Of Rails at Ends of Rooms

Plan Designed to Speed Rail Recovery So That Track May Be Withdrawn Before Roof Falls—Requires No New Equipment Unless Steel Ties Are Not Being Used

By Thomas J. Downing, Jr.
General Manager, Logan County Coal Corporation, Lundale, W. Va.

Mine ties of steel as compared with wood ties give greater headroom between the top of the rail and the roof, lessen the height the miner has to raise his coal in loading it into the car, last longer, are handled and stored with greater convenience, are more uniform in quality and size, are laid more easily, cannot be used so as to give the wrong gage but almost above all permit of prompt recovery of track from the zone of danger when a fall is imminent near the face of a room or in the pocket of a pillar that is being drawn back.

As they are not cumbersome in either size or shape and as the method by which the rails are attached to them is one that makes tracklaying easy, miners can readily draw them back when a fall of roof impends.

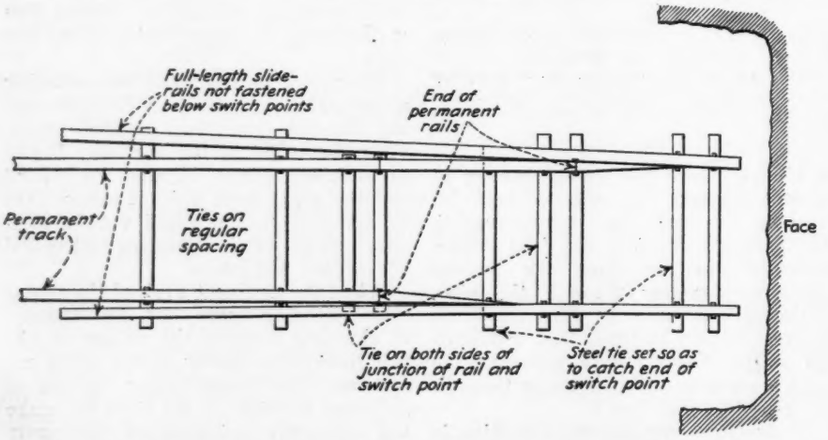
The means for extending and removing extension rails in the mines of the Logan County Coal Corporation, at Lundale, W. Va., is illustrated herewith. It has been used for many years in those workings with such success that we have felt warranted setting it up as one of our standard practices. It not only provides a way of extending two slide rails from the permanent room track to the face but it also enables the miner to pull them out of danger with little manual effort whenever conditions at the face indicate the possibility of a roof fall.

As the illustration shows, the rails used for extension are of full length, and slide along the outside of the permanent rails. Two switch points are used in jumping from the permanent to the slide rails. The first attachment of a steel tie to the slide rail is made at the switch point by causing the button on the tie to engage the switch point.

Then two ties are placed on each side of the joint between the permanent rail and the butt end of the switch point. Those portions of the slide rails which extend in front of the switch points are joined by ties spaced at regular intervals as if the track were permanent. It will be noted that the ties to the rear of the switch point do not connect the permanent track in any way with the slide rails.

When this method is used for the laying of room track, no gob must be left near the loose rails. Otherwise they might be raised thereby to such a level that they would catch the cars passing over the track adjacent to them, thus causing them to be derailed.

The advantage of this simple arrangement is twofold, as the track may be both laid and torn up with facility. The kicking open of a few lug nuts or clips allows the slide section of the track to be dragged bodily from under a manifestly weak piece of roof. Much steel may be saved by adopting this or a similar arrangement in pillar sections, wherever prevailing dangers and the labor involved otherwise do not warrant attempts at recovering steel once it is buried. Details for governing the exercise of this practice are scarcely necessary. Whether the track is laid to the face by company men or the miners themselves, the bosses whose duty it is to see that the workmen do their work in a manner that will avoid accidents at the same time can save steel by giving proper instructions when necessary.


Full-length slide-rails not fastened below switch points
End of permanent rails
Permanent track
Ties on regular spacing
Face
Tie on both sides of junction of rail and switch point
Steel tie set so as to catch end of switch point

SWITCH-POINT METHOD OF EXTENDING TRACK AT WORKING FACE

Ordinary steel ties are used but switch points are provided, held in place at both ends by ties. These switch points, of course, are kept closed at all times, as they furnish the means of passing from the permanent to the extension track and back again.

Fighting Coal-Dust Menace In the Transvaal

Says H. Walker, inspector of the Scotland division of Great Britain, in his report for 1919: "The usual attitude at any particular mine where coal dust occurs is a ready acceptance of the fact that, generally speaking, such dust is dangerous, but a firm belief that in the mine under consideration it is perfectly harmless. Such an attitude is difficult to combat. All argument, other than a rude awakening in the shape of a disastrous explosion, I fear, would be futile." He could not have put the matter more fortunately had he been writing about the United States and its coal mines.

With these words of Mr. Walker, J. P. Hindmarsh prefaces his remarks on coal-dust explosion prevention in the "Annual Report of the Department of Mines of South Africa, 1922," as acting chief inspector of coal mines. He says "The necessity for dealing with coal dust becomes more and more pressing as the mines get older and larger areas are opened up. Coal begins to flake off the pillars left standing, and this in turn is ground into dust by the feet of the men and horses and the wheels of cars in transit."

He adds that at least "one mine in this state has commenced rock dusting." The Abermain Seaham Collieries, Ltd., has installed at its No. 2 Seaham Colliery a ball mill for crushing rock. It is belt-driven from a vertical steam engine of 25 hp., a conveyor being built from the shaft top to the mill, which is

about 20 ft. therefrom. The shale is obtained from the roof of the Borehole Seam.

In order to prevent any coal from being mixed with it, it is hand-filled into cars, the rock being taken from the goaf edge of pillars and sent out of the mines. When the cars reach the top of the shaft they are tipped direct into a chute, or hopper, at the mill. The shale runs down the chute onto the mill floor and is there broken into cubes not larger than 6 in. across and fed into the mill by hand. The man attending the engine and mill breaks the stone and feeds it to the mill, the capacity of which is 1,000 lb. per hour of the finished product.

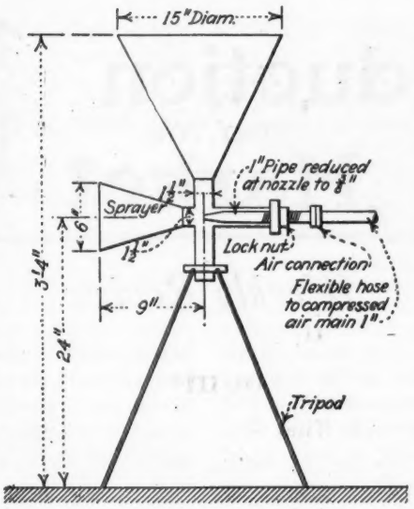
On leaving the mill the rock dust falls into a small hopper and then into a car standing on rails at the surface level. When the car is full it can be run direct into the cage at the surface. When it reaches the mine workings it is distributed along the haulage road (either loose or in bags) into stations about 220 ft. apart. In practice this distance has been found not too long for the thorough rock dusting of the roadway. The dust is distributed by ejectors operated by compressed air at a pressure of 80 lb. per square inch. A short length of 1-in. hose is attached to the air main at one end and to the ejector at the other, the nozzle being reduced from 1 in. to § in. Rock dust is filled into the funnel-shaped vessel by hand and is blown out of the sprayer in a dense cloud which is carried forward and distributed by the air current.

Air Will Carry Dust a Mile

Dust has been deposited in this way over a mile from the injector with an air currrent having a velocity of about 480 ft. per minute, but to make an effective distribution it has been found necessary to have injectors every 220 ft., as previously stated. In this way a ton of dust can be sprinkled over the gallery in about an hour. The rule at present is to distribute 2 tons each shift, the dust being thus scattered only at night.

The cost of preparing and distributing the dust is estimated at about 2c. per ton on an output of 1,200 tons per day, the charge covering interest and depreciation. This does not include cleaning up or preparing the roadways. In preparing the roadway before stone dusting all the débris is not sent out of the mine. A new face wall is built, and the débris put behind it. The cost of erecting and equipping the mill complete was about $8,500. The stone dust, being of a light color as compared with the dull black surface of the coal, noticeably improves the illumination of the roadways.

The shale contains water evaporated at or below 100 deg. C., 1.25 per cent; volatile matter and water evaporated above 100 deg. C., 10.47; combined silica, 22.68; free silica, 33.30; alumina, 15.64; ferric-oxide iron, 8.60; titanium dioxide, 0.60, and carbon, 1.70. The free silica may appear high, but it may be said that the Altofts shale has 35 per cent of that ingredient out of a total silica content of 52 per cent. Long experience has shown that it could be used with perfect impunity in the dusting of mines, not being harmful to the lungs. The silica dust is believed not to be injurious when mixed with coal dust. Under the microscope no sharp angles can be seen and the dust is very fine.



SPRAYS INERT DUST OVER LOOSE COAL IN ROADWAY

Set 220 ft. apart these ejectors cover the floor, sides and timbers of roadways with fine dust, which makes them almost explosion-proof.

It will be noted in passing that the rock is broken down by hand and not by a jaw crusher, as might be more economical. Nothing is said as to the cost of the air. The plan of storing the dust from the roadways in the mine is not one which would seem likely to meet with commendation, even though a face wall is left as a partial defense against the raising of a dust cloud.

Peril in Use of Carbide Lamp When Testing for Gas

By W. H. Luxton
Linton, Ind.

Narrow, indeed, are the escapes of those who carry a carbide lamp to supplement the light from their safety lamps when making an inspection for gas. A few years ago, one fireboss replaced another at a coal mine because the latter was desirous of taking a much needed vacation. While making his examination with a safety lamp the fireboss who was preparing to leave carried a carbide lamp with him, being careful to hold it low. All went well—that morning. When the new fireboss made his visit he also took a carbide lamp, but left it well back when approaching the face of a working place.

He soon had occasion to realize that his precaution was well taken. On entering one of the places which he had to examine he ran into a large body of gas at a point 80 to 100 ft. from the face of the entry. What the result would have been had he carried his carbide lamp with him may well be imagined.

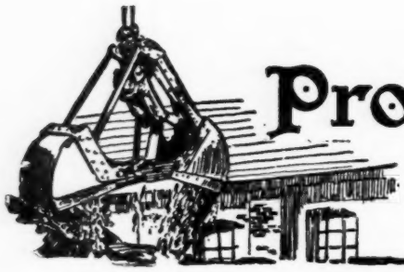
The ventilation of that section of the mine depended on the operation of a booster fan, which was running when he reached it. He would have known full well, had he found it standing still, that the headings would be full of gas. He did not know, however, that the fan had been stopped and was started again only a short time before his arrival by one of the night shift who failed to notify the fireboss of the circumstance. Just such happenings as this have cost many a fireboss his life, and only his leaving the carbide lamp which he carried on his trip a safe distance behind saved that particular fireboss from a similar fate.

Use Electric Sprinkling Tanks To Water Roads in West

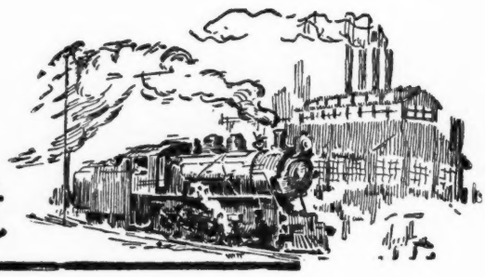
Without sufficient pressure to wet down roof and ribs no water car can be effective in mine sprinkling. The sprinkling of roadways with a mere tank car is not effective, as it does not touch the dry, fine, settled dust on timbers and rib ledges. This was the dictum of D. Harrington in a report on the prevention of coal-mine explosions to the chairman of the committee on safety of the Rocky Mountain Coal Mining Institute.

In discussion William Littlejohn, general superintendent of the Utah Fuel Co., Castle Gate, Utah, said that the coal at the Castle Gate mine was the most inflammable that had been tested at the Pittsburgh Station of the U. S. Bureau of Mines. He said that at Castle Gate and Sunnyside had been built two 500-gallon tank trucks each with a pump on one end of the truck driven by a motor which gets its power from the mine circuit. The other end of the truck has a semicircular perforated pipe. The truck is hooked onto an electric locomotive. When the pump is started it throws a fine spray which wets roof, sides and floor. With it a roadway that a man with an ordinary hose and spray could sprinkle only in two shifts, could be wetted down in half a day and the job would be more thoroughly done.

The company is expecting to use the system on rope haulageways, which, of course, will have to be run by a reel from the feed lines. The conductor lines on these reels will have to be about 400 ft. long. George B. Pryde, the general superintendent, said that the Union Pacific Coal Co. had also built two tank cars of 600 gallons capacity which are connected with hose so that the water can flow from one tank to the other. A centrifugal pump mounted on a truck is connected to the front tank. This pump takes its power from the trolley wire. The discharge from the pump being perforated it sprays the floor and sides of the entries. This water train will be used on such main haulageways as have no sprinkling equipment.



Production and the Market



Weekly Review

Weather conditions and the usual holiday spirit dominate the soft-coal market. Production is in keeping with the general downward tendency toward the end of each year; in both hard- and soft-coal fields there is a letting down in demand. The Geological Survey summarized conditions last week by noting that twenty-one districts out of thirty-two record a gain in time lost because of lack of demand; and twenty-four districts are operating with losses of 40 per cent or more of full time capacity due to poor market.

Thanksgiving Day, which was more generally observed than in previous years, resulted in a heavy cut in production, output during the week ended Dec. 1 amounting to 8,923,000 net tons, a decline of 1,237,000 tons from the previous week and 14 per cent less than for the corresponding week of last year. Output for last week, it is estimated, will not exceed 10,000,000 tons. For the first 283 working days of the present year production has been 506,813,000 net tons, according to the Geological Survey, which is about 33,000,000 tons below the record year of 1918, but larger than the low years of 1919, 1921 and 1922.

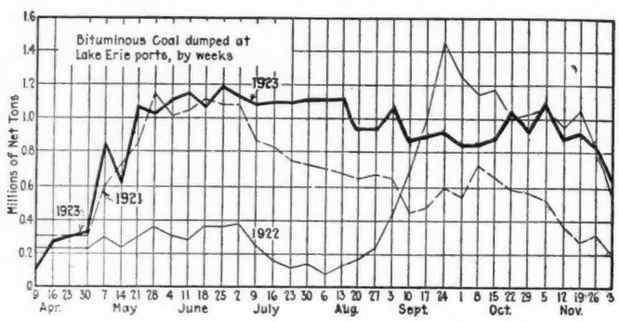
Prices Reflect Low Demand

The downward tendency of the market is reflected in *Coal Age* Index as of Dec. 10, which stands at 180 as compared with 181 for the previous week, with an average price of $2.18, a drop of 1c. and a new low mark for the present year. Increases in Standard, eastern and western Kentucky, Hocking and Kanawha districts were overcome by decreases in southern Illinois, Mt. Olive, Springfield, Clinton, Pocahontas, Cambria and Somerset coals.

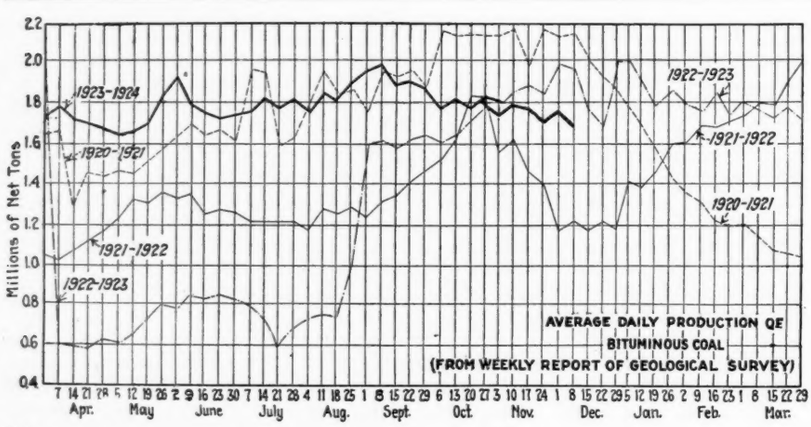
There was a drop in demand in all domestic sizes of southern Illinois coal and with the exception of screenings the market in the central and western parts of the country was lifeless. In most parts of Ohio the smokeless market was draggy and dull, the greatest activity being noted in slack. Retail dealers are stocked up and householders do not want to add to their winter supply. Steam coals move slowly and with lake shipments almost ended it is expected that demand for everything except slack will show a more pronounced falling off. Pittsburgh is in poor shape as far as demand goes, while operators in central Pennsylvania assert that they see a slight betterment. There is no improvement noted along the Atlantic seaboard.

In the East there is moderate interest in the market after Jan. 1. Consumers are inquiring for contract prices covering the first quarter of 1924, but some operators are inclined to hold back for the open market. It is reported that bunker prices covering the entire twelve months had been quoted at $6.25@$6.50.

Easier conditions are evident in the anthracite market. There is less urgency and with less hard coal going westward for lake shipment quotations for independent product are slightly lower than they were a week ago. Production for the week ended Dec. 1 is estimated to have



	Weed Ended Dec. 3	Season to Dec. 3
Cargo	573,132	29,640,945
Fuel	28,106	1,589,575
Totals	601,238	31,230,520



Estimates of Production

(Net Tons)

	1922	1923
BITUMINOUS		
Nov. 17	11,215,000	9,717,000
Nov. 24 (*a*)	11,100,000	10,160,000
Dec. 1 (*b*)	10,387,000	8,923,000
Daily average	1,982,000	1,763,000
Calendar year	365,437,000	506,813,000
Daily av. cal. year	1,289,000	1,792,000
ANTHRACITE		
Nov. 17	2,230,000	1,725,000
Nov. 24	2,213,000	2,100,000
Dec. 1	1,852,000	1,748,000
Calendar year	46,718,000	88,204,000
COKE		
Nov. 24 (*b*)	288,000	257,000
Dec. 1 (*a*)	298,000	244,000
Calendar year	6,900,000	16,936,000

(*a*) Subject to revision. (*b*) Revised from last report.

been 1,748,000 net tons, a drop of 352,000 tons from the previous week, due to the holiday and the last day of the week being pay day for the workers. It is not anticipated by the Geological Survey that the output for last week reached 2,000,000 net tons.

France again led all other countries as buyer of coal from Baltimore during November, recovering the lead attained during August and September. During November thirteen vessels leaving Baltimore carried 62,389 tons of bunker and cargo coals, and one ship took 4,050 tons of coke. In October of this year ten ships took 51,753 tons of cargo and bunker coals, and two ships carried 5,375 tons of coke.

Midwest Slumps Lower

A drop in prices on all domestic sizes of southern Illinois coal took effect Monday of this week. Warmth prevails throughout the whole central and western part of the country and the market is absolutely lifeless on everything but screenings. There would be little interest even in steam coals were it not for the low output of practically every mine. The price of fines has risen enough to move several producers to begin crushing their lump.

Southern Illinois sceenings brought $1.75 at the end of last week and were strong at the price. Central Illinois fine sizes ranged around $1.50 and Fourth and Fifth Vein Indiana screenings, respectively, were moving at those two quotations. The only hope of Midwest operators for the rest of the month lies in steam coal, barring a blizzard of considerable length, for there is little money in the new scale of prices. Franklin County lump, egg and nut in the new circular are now $3.75, $3.50 and $3.25 as compared with previous figures 25c. to 60c. above those levels.

Practically all domestic coals are weak at whatever the circulars call for. East Kentucky, which has been striving to hold firm at $3.50, is sinking and west Kentucky lump is going at almost any bid. The flood of cheap Pocahontas mine-run—$1.50@$2 at the mine—is having a marked effect upon trade throughout Indiana, Illinois and parts of Iowa and Michigan.

Several Illinois mines have been idle for over a week,

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern	Market Quoted	Dec. 11 1922	Nov. 26 1923	Dec. 3 1923	Dec. 10 1923†
Smokeless lump	Columbus	$6.25	$4.10	$4.10	*$3.50@$4.00*
Smokeless mine run	Columbus	6.00	2.10	2.10	2.00@ 2.25
Smokeless screenings	Columbus	5.50	1.30	1.30	*1.20@ 1.35*
Smokeless lump	Chicago	7.75	4.50	4.10	*3.25@ 3.50*
Smokeless mine run	Chicago	6.25	2.25	2.00	*1.50@ 2.00*
Smokeless lump	Cincinnati	6.55	4.25	3.10	**3.00@ 4.00**
Smokeless mine run	Cincinnati	5.40	2.10	2.00	1.75@ 2.25
Smokeless screenings	Cincinnati	5.30	1.50	1.35	**1.25@ 1.75**
*Smokeless mine run	Boston	7.75	4.65	4.60	*4.40@ 4.60*
Clearfield mine run	Boston	3.60	2.15	1.85	1.50@ 2.25
Cambria mine run	Boston	4.35	2.60	2.50	*2.00@ 2.75*
Somerset mine run	Boston	3.85	2.35	2.10	1.75@ 2.50
Pool 1 (Navy Standard)	New York	5.25	3.00	3.00	2.75@ 3.25
Pool 1 (Navy Standard)	Philadelphia	5.15	3.00	3.00	2.80@ 3.20
Pool 1 (Navy Standard)	Baltimore	5.00	.....	.....	.....
Pool 9 (Super. Low Vol.)	New York	4.60	2.35	2.35	*2.00@ 2.50*
Pool 9 (Super. Low Vol.)	Philadelphia	4.65	2.30	2.30	2.25@ 2.45
Pool 9 (Super. Low Vol.)	Baltimore	4.35	2.05	2.05	**2.25**
Pool 10 (H.Gr.Low Vol.)	New York	4.00	2.00	2.00	*1.65@ 2.25*
Pool 10 (H.Gr.Low Vol.)	Philadelphia	3.95	1.85	1.85	1.75@ 2.00
Pool 10 (H.Gr.Low Vol.)	Baltimore	4.00	1.90	1.90	**2.20**
Pool 11 (Low Vol.)	New York	3.25	1.55	1.65	**1.60@ 2.00**
Pool 11 (Low Vol.)	Philadelphia	3.35	1.70	1.70	1.60@ 1.75
Pool 11 (Low Vol.)	Baltimore	3.10	1.75	1.75	**1.90**
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	$2.80	$1.60	$1.60	$1.50@$1.75
Pool 54-64 (Gas and St.)	Philadelphia	3.35	1.65	1.65	1.50@ 1.75
Pool 54-64 (Gas and St.)	Baltimore	3.00	1.70	1.70	**1.85**
Pittsburgh sc'd gas	Pittsburgh	5.25	2.55	2.55	2.50@ 2.60
Pittsburgh gas mine run	Pittsburgh	.....	2.25	2.25	2.20@ 2.30
Pittsburgh mine run (St.)	Pittsburgh	2.60	2.00	2.00	**2.00@ 2.10**
Pittsburgh slack (Gas)	Pittsburgh	3.25	1.25	1.30	**1.50**
Kanawha lump	Columbus	5.25	3.00	3.00	2.85@ 3.15
Kanawha mine run	Columbus	3.25	1.85	1.85	1.75@ 2.00
Kanawha screenings	Columbus	2.80	.80	.80	*.75@ .85*
W. Va. lump	Cincinnati	5.75	3.15	2.75	**2.50@ 3.25**
W. Va. Gas mine run	Cincinnati	3.35	1.50	1.50	**1.50@ 1.75**
W. Va. Steam mine run	Cincinnati	3.25	1.50	1.50	**1.50@ 1.75**
W. Va. screenings	Cincinnati	3.00	.85	.50	**.75@ 1.00**
Hocking lump	Columbus	4.75	2.95	2.95	2.85@ 3.10
Hocking mine run	Columbus	2.60	1.85	1.85	1.75@ 2.00
Hocking screenings	Columbus	2.50	.80	.80	**1.00@ 1.10**
Pitts. No. 8 lump	Cleveland	4.10	2.55	2.55	*1.90@ 3.00*
Pitts. No. 8 mine run	Cleveland	3.10	1.95	1.90	**1.90@ 2.00**
Pitts. No. 8 screenings	Cleveland	2.85	1.15	1.40	*1.30@ 1.40*

Midwest	Market Quoted	Dec. 11 1922	Nov. 26 1923	Dec. 3 1923	Dec. 10 1923†
Franklin, Ill. lump	Chicago	$5.25	$4.10	$4.10	*$3.50@$3.75*
Franklin, Ill. mine run	Chicago	4.10	2.35	2.35	2.25@ 2.50
Franklin, Ill. screenings	Chicago	2.35	1.45	1.55	**1.65@ 1.75**
Central, Ill. lump	Chicago	4.25	3.10	3.10	*2.75@ 3.25*
Central, Ill. mine run	Chicago	3.10	2.10	2.10	2.00@ 2.25
Central, Ill. screenings	Chicago	1.65	1.05	1.35	**1.40@ 1.50**
Ind. 4th Vein lump	Chicago	5.10	3.35	3.35	*3.00@ 3.50*
Ind. 4th Vein mine run	Chicago	3.85	2.60	2.60	2.50@ 2.75
Ind. 4th Vein screenings	Chicago	2.25	1.35	1.55	**1.60@ 1.75**
Ind. 5th Vein lump	Chicago	4.75	2.50	2.50	2.25@ 2.75
Ind. 5th Vein mine run	Chicago	3.60	2.10	2.10	2.00@ 2.25
Ind. 5th Vein screenings	Chicago	2.00	.95	1.30	**1.40@ 1.50**
Mt. Olive lump	St. Louis	.....	3.10	3.10	*2.75@ 3.25*
Mt. Olive mine run	St. Louis	.....	2.25	2.25	2.20@ 2.30
Mt.Olive screenings	St. Louis	.....	1.25	1.25	**1.50@ 1.60**
Standard lump	St. Louis	4.25	3.05	3.05	*2.75@ 3.00*
Standard mine run	St. Louis	2.25	2.05	2.05	1.80@ 2.30
Standard screenings	St. Louis	1.35	.55	.55	**1.10@ 1.25**
West Ky. lump	Louisville	3.75	3.00	3.00	2.75@ 3.25
West Ky. mine run	Louisville	2.25	1.75	1.70	1.50@ 1.90
West Ky. screenings	Louisville	1.50	.65	.70	**.80@ 1.25**
West Ky. lump	Chicago	3.85	2.85	2.85	2.75@ 3.00
West Ky. mine run	Chicago	2.60	1.75	1.75	1.50@ 2.00
South and Southwest					
Big Seam lump	Birmingham	3.95	3.85	3.85	3.75@ 4.00
Big Seam mine run	Birmingham	2.35	1.95	1.95	1.75@ 2.15
Big Seam (washed)	Birmingham	2.60	2.35	2.35	2.25@ 2.50
S. E. Ky. lump	Chicago	6.25	3.25	3.10	3.00@ 3.25
S. E. Ky. mine run	Chicago	4.25	1.85	1.85	1.75@ 2.00
S. E. Ky. lump	Louisville	6.35	3.50	3.35	3.00@ 3.75
S. E. Ky. mine run	Louisville	3.35	1.85	1.75	1.50@ 2.00
S. E. Ky. screenings	Louisville	3.25	.75	.80	*.65@ .85*
S. E. Ky. lump	Cincinnati	5.85	2.60	3.00	**2.75@ 3.50**
S. E. Ky. mine run	Cincinnati	3.35	1.50	1.50	**1.35@ 1.75**
S. E. Ky. screenings	Cincinnati	2.80	.85	.65	**.65@ 1.25**
Kansas lump	Kansas City	5.00	5.10	5.10	*4.50@ 5.00*
Kansas mine run	Kansas City	3.50	3.25	3.25	3.00@ 3.50
Kansas screenings	Kansas City	2.50	2.00	2.00	2.00

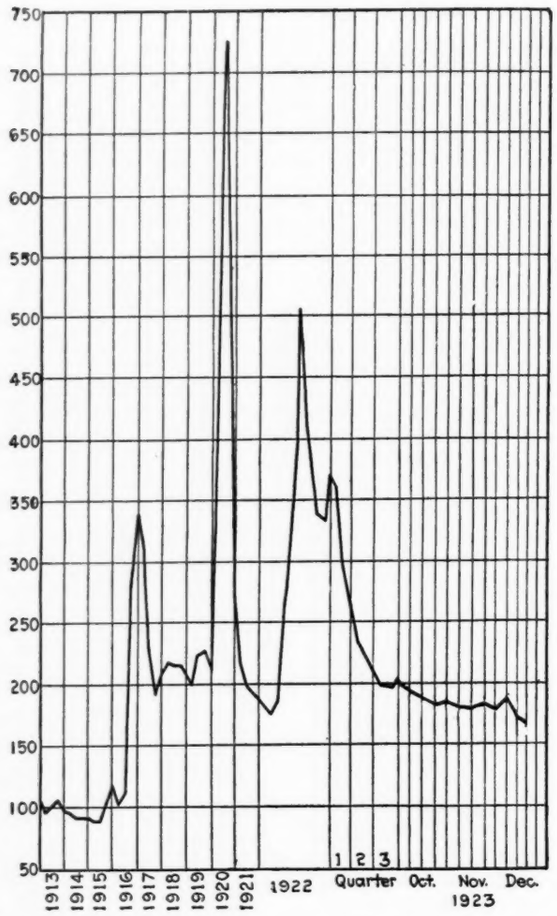
* Gross tons, f.o.b. vessel, Hampton Roads.

† Advances over previous week shown in **heavy type**, declines in *italics*.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

	Market Quoted	Freight Rates	Dec. 26, 1922 Independent	Dec. 26, 1922 Company	Dec. 3, 1923 Independent	Dec. 3, 1923 Company	Dec. 10, 1923† Independent	Dec. 10, 1923† Company
Broken	New York	$2.34	$9.00	$7.75@$8.25	$8.50@10.00	$8.00@$9.25	$8.50@10.00	$8.00@$9.25
Broken	Philadelphia	2.39	.....	7.90@ 8.10	.....	.....	.....	.....
Egg	New York	2.34	9.25@12.00	8.00@ 8.35	9.85@12.25	8.75@ 9.25	*9.85@11.00*	8.75@ 9.25
Egg	Philadelphia	2.39	9.25@11.00	8.10@ 8.35	9.85@12.20	8.75@ 9.25	9.85@12.20	8.75@ 9.25
Egg	Chicago*	5.06	12.50@13.00	7.20@ 8.25	9.60@12.50	8.00@ 8.35	9.60@12.50	8.00@ 8.35
Stove	New York	2.34	9.25@12.00	8.00@ 8.35	9.85@12.25	8.75@ 9.25	*9.85@12.00*	8.75@ 9.25
Stove	Philadelphia	2.39	9.25@11.00	8.15@ 8.35	9.85@12.20	8.90@ 9.25	9.85@12.20	8.90@ 9.25
Stove	Chicago*	5.06	12.50@13.00	7.35@ 8.25	9.60@12.50	8.00@ 8.35	9.60@12.50	8.00@ 8.35
Chestnut	New York	2.34	9.25@12.00	8.00@ 8.35	9.85@12.25	8.75@ 9.25	*9.85@12.00*	8.75@ 9.25
Chestnut	Philadelphia	2.39	9.25@11.00	8.15@ 8.35	9.85@12.20	8.90@ 9.25	9.85@12.20	8.90@ 9.25
Chestnut	Chicago*	5.06	12.50@13.00	7.35@ 8.35	9.60@12.50	8.00@ 8.35	9.60@12.50	8.00@ 8.35
Range	New York	2.34	.....	8.25	.....	9.00	.....	9.00
Pea	New York	2.22	7.00@11.00	6.15@ 6.30	6.15@ 7.50	6.15@ 6.65	*6.00@ 7.25*	6.15@ 6.65
Pea	Philadelphia	2.14	7.00@ 8.00	6.15@ 6.20	6.75@ 9.00	6.35@ 6.60	6.75@ 9.00	6.35@ 6.60
Pea	Chicago*	4.79	7.00@ 8.00	5.49@ 6.03	6.00@ 6.75	5.40@ 6.05	6.00@ 6.75	5.40@ 6.05
Buckwheat No. 1	New York	2.22	4.00@ 5.00	4.00@ 4.10	1.75@ 3.50	3.50	1.75@ 3.50	3.50
Buckwheat No. 1	Philadelphia	2.14	5.00	4.00	2.25@ 3.50	3.50	2.25@ 3.50	3.50
Rice	New York	2.22	3.00@ 3.25	2.75@ 3.00	1.25@ 2.50	2.50	**1.35@ 2.50**	2.50
Rice	Philadelphia	2.14	2.50@ 2.75	2.75@ 3.00	1.75@ 2.50	2.50	1.75@ 2.50	2.50
Barley	New York	2.22	1.75@ 2.00	1.50@ 2.00	1.00@ 1.50	1.50	**1.25@ 1.50**	1.50
Barley	Philadelphia	2.14	1.00@ 1.75	2.00	1.00@ 1.50	1.50	1.00@ 1.50	1.50
Birdseye	New York	2.22	.....	2.10	.....	1.60	1.25@ 1.45	1.60

* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in *italics*.



Coal Age Index of Spot Prices Bituminous Coal F.O.B. Mines

	1923			1922
	Dec. 10	Dec. 3	Nov. 26	Dec. 11
Index	180	181	186	325
Weighted average price	$2.18	$2.19	$2.25	$3.93

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States weighted first with respect to the proportions each of slack, prepared and run-of-mine normally, shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913, 1918," published by the Geological Survey and the War Industries Board.

unable to move sizes. This is causing a shortage of screenings. Some mines work one day a week and a few get as much as four days. Railroad tonnage is light. Car supply is good and general dissatisfaction prevails throughout all southern Illinois fields among the miners. In the DuQuoin and Jackson County field operations have almost ceased, excepting at a few mines that get three and four days a week. Prices range up to but seldom above cost.

In the Mt. Olive field everything is at a standstill on account of inability to move domestic sizes. The smaller steam sizes are all cleaned up. The same condition prevails in the Standard district, where screenings and small nut are scarce and everything else is unbilled. The Mt. Olive district gets about one day a week work. In the Standard district they get from one to two days a week, excepting railroad mines.

St. Louis Does Little

A little cool weather keeps some coal yards moving small quantities of the middle grade coal. Domestic demand is very light and there is little moving, with all yards loaded. The consuming public will not buy Franklin County lump at $8 when Mt. Olive is $6.50 and Standard $5.25. There is no demand for smokeless, anthracite or coke. Country domestic is also light. Local wagonload steam shows some improvement. Carload is slow and the steam demand here is usually for shipment to Chicago or the north.

Kentucky Unhappy Too

General reports from the west Kentucky field indicate that business is slow and that additional mines are closing down through lack of market. About sixty of the really permanent type of mines are down, and the balance are running irregularly at about 30 per cent of potential time and 28 per cent of potential capacity. Strip mines are reported to have shipped something over 1,700 cars of coal in November—a little over 10 per cent of the total moved from the field.

Operators are endeavoring to push up screenings in price, but are meeting with cheap screenings from eastern Kentucky and other sections. Some mines are producing little prepared coal, and haven't many cars of screenings to sell, or have contracted or sold for the time being, with the result that they are quoting high to force a stiffer market, but without much result.

Car supply is full on all Kentucky roads. Prices show little change, though some eastern Kentucky coal in distress lately has sold down to the bottom. Horse Creek, Harlan and Hazard have all contributed their share of this.

Northwest Trade is Somnolent

Nothing has happened during the week to awaken any fuel interest in the Northwest except the virtual wind-up of the shipping season. Tremendous dock supplies are now at the Head-of-the-Lakes and all the other ports down to Milwaukee, both of soft coal and anthracite. This is so comforting to Northwest consumers that the warmth of the week lulled them practically to sleep and trade is flat. Shipment off the docks is slow.

Government engineer office figures show total receipts at the Head-of-the-Lakes up to Dec. 1 to have been 12,529,758 tons—over 11,000,000 tons of soft coal and 1,400,000 of anthracite—which compares with only 7,125,000 tons last year and an average of about 9,120,000 tons for the past ten years. November shipments to Duluth, 1,440,000 tons of soft coal and 215,321 tons of hard, were greater than was expected. Insurance goes off Dec. 12. Milwaukee season totals to Dec. 1 were 3,155,000 tons of bituminous and 930,000 tons of anthracite.

West Idles Along

Prevailing pleasant weather holds down the coal business throughout the Kansas City, Denver and even the Salt Lake City regions in spite of a snow flurry in Utah. Working time in that state is barely 50 per cent and low production aids the screenings price a little, but only enough to stop the dumping that has been general. Utah mine prices on lump, egg and pea are $4.50, $3.75 and $2. The Colorado market continues to slump with the December summer weather. Working time in a majority of the mines in the state averaged twenty-five hours last week. Price circulars have not changed since Sept. 1.

A slight surplus of Kansas lump and nut has begun to collect at mines, with no relief from the screenings surplus, evident all the season. There is little demand for Arkansas semi-anthracite of any grade and there is talk of closing down more mines throughout the Southwest. Various operating concerns report their mines working from 40 to 60 per cent of normal. Circulars remain the same as last month, though reports of shading are becoming more numerous.

Ohio Market Dull

The market for smokeless coals in the Cincinnati territory continues draggy and dull. Weather conditions are not suitable for coal consumption. Slack no longer goes begging, although the demand for other coals is slow and inactive. Supplies at Toledo are reported to be heavy. With the gradual dropping in the price of domestic coals and the disposition of mine run to hold up, more and more of the heavy producing mines still running have turned to the making of unscreened coals.

The dullness in the Columbus market was attributed

largely to weather conditions. Dullness prevailed in both the steam and domestic trade and it is the belief of producers and shippers that lower temperatures will be needed to stimulate the market. Retail dealers are well stocked and householders refuse to buy. With the end of the year near dealers are inclined to await the inventory season before adding to their supplies. There is no activity in the steam trade. Reports received by the Southern Coal Exchange show that during the week ended Nov. 24 output from 443 mines, with a capacity of 695,490 tons, amounted to 168,295 tons. "No market" was responsible for a loss of 491,544 tons.

Conditions in the Cleveland market are slow. Steam coal does not move in good volume and domestic coal consumption is not large because of weather conditions. Production in the eastern Ohio field is lower and a still greater decline is expected to follow the stoppage of lake shipments.

Operators and dealers in the Pittsburgh district alike regard the coal market as in very poor condition. Prices on slack are higher and on steam mine-run a shade firmer. The advance in slack was expected, with the cutting off of a large production on account of the ending of the lake season, and to make the situation worse steam lump softened. Sellers of bituminous coal have been unable to develop any interest among buyers in a possible strike or suspension on April 1, buyers acting as if it was a foregone conclusion that the scale will be renewed on the old basis without any interruption. Conditions at Buffalo continue dull with practically no demand. More West Virginia coals are being received than is generally the case.

New England Industries Marking Time

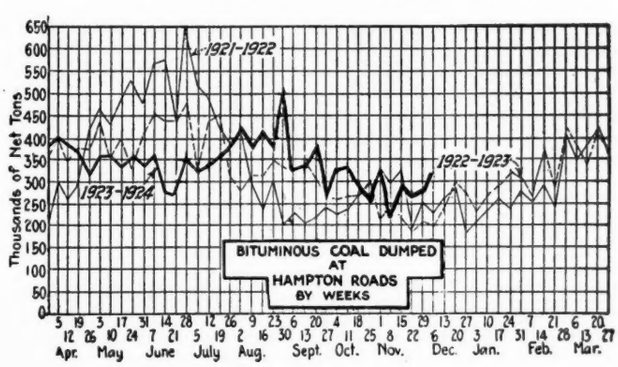
Industries in New England for the most part are marking time and there is nothing in the present situation to justify adding to present large stocks of coal for steam use. There is no buying of any moment and any improvement in demand is now unlikely until after the holidays. A few special lines of textiles are having fair business, but the bulk of New England's cotton-goods trade is stagnant. If prices move up in January it is possible that there might on that account be somewhat better inquiry for bituminous.

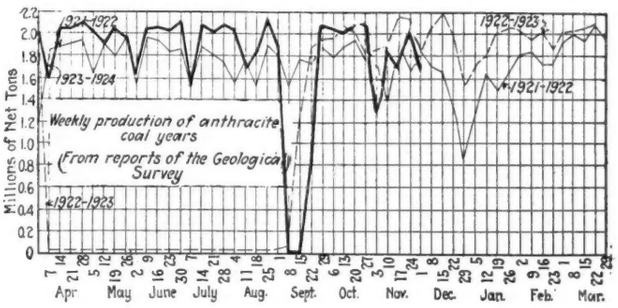
The Hampton Roads agencies are very much in the doldrums. Several of the large producers have restricted output to the barest requirements of contract obligations and tonnages are correspondingly light. Prices continue on last week's level, an occasional sale in cargo lots returning to the operator $4.35@$4.50 per gross ton, f.o.b. vessel, or $1.83@$1.98 at the mine, for coal No. 1 Navy standard grade.

On cars Boston and Providence there are quotations of wide range, $5.50@$6 being "mentioned," but it is said that 500-ton lots are still being disposed of at $5.25@$5.40.

All-rail inquiry is almost nil. Reasonably good grades of Pennsylvania coals roughly classified as "Pool 9" are offered down to $2 at the mine, with less favorably known coals quoted at $1.60@$1.75. There appears no opening for coal all-rail so long as the New River and Pocahontas factors are obliged to hammer down prices in order to move coal.

There is coal from the Pennsylvania districts moving by the water route, especially from Philadelphia, but investigation shows the cargoes are made up either of gas coal for


1921-1922
1922-1923
1923-1924
BITUMINOUS COAL DUMPED AT HAMPTON ROADS BY WEEKS
Thousands of Net Tons
Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar.


1921-1922
1922-1923
1923-1924
Weekly production of anthracite coal years
(From reports of the Geological Survey
Millions of Net Tons
Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar.

illuminating purposes or they are going forward on purchases made at a time when Southern coals were much higher in price.

Better Tone on Seaboard

The soft-coal market at New York boasts of a better tone. Inquiry is greater, but actual business is slow. The tidewater market is stronger and prices firmer. Consumers are inquiring as to the prospects after Jan. 1 and until April 1, when the present wage agreement with the soft-coal producers expires. Some operators are inclined to take chances in the open market after Jan. 1, instead of making contracts covering the first three months of 1924. Receipts at tidewater piers last week were well above the previous week, while daily dumpings for the first five days of the week at four of the largest piers averaged 380 cars. No change in conditions was noted at Philadelphia. Demand remains quiet. With the exception of slight increases in the various grades of soft coal at Baltimore that market shows no change. Demand is poor and dealers have a hard time booking new orders.

Conditions at Birmingham present no encouraging features. Buying of commercial coal is practically at a standstill, but there has been a slight improvement in domestic sales and more favorable conditions exist for further betterment in the demand of household coals. Railroads are stocking some coals for the holidays, but on account of the limited schedule on which mines are now operating the holidays will have little effect on the output.

Anthracite Demand Easier

The anthracite market is easier. Cancellations continue to be received by some New York wholesale dealers, and retailers find that receipts of the favorite sizes are larger. Egg and pea coals are easy, while stove and chestnut are being received in large enough tonnages to take care of immediate needs. Some retail dealers in sections of New York City are advertising all sizes for immediate delivery. Quotations for independent domestic coals are gradually lowering. Pea coal was offered during the week alongside, New York harbor, on a basis of about $6, f.o.b. mine, and it was said that a public utility corporation had received bids for more than 1,000 tons of this sized coal at a similar figure. The steam coals are hard to move and quotations for the cheaper grades are low.

Conditions at Philadelphia remain quiet but dealers find no difficulty in placing all the stove and chestnut sizes they receive. At Baltimore although dealers complain of the lack of shipments, there is no great rush on the part of consumers.

The general tone of the Connellsville coke market is not as good as a couple of weeks ago and is not justifying all the expectations recently entertained by operators, based on the recent pig-iron buying movement. The report is confirmed that two furnace interests contracted for first-quarter coke at $4.40, but that particularly good coke was involved. Standard coke is being offered at around $4.25. Two makers of particularly high-class foundry coke have put out prices for first quarter at from $6 to $6.50 and it is said some contracts have been closed. Production of beehive coke during the week ended Dec. 1, according to the Geological Survey, amounted to 244,000 net tons, as compared with 257,000 tons the previous week.

Foreign Market And Export News

British Coal Production Increasing; Prices Show More Strength

Quotations on various grades of British coal for the week ended Dec. 8 show a substantial increase over the previous week, as a result of a firmer demand. Production is increasing, output for the week ended Nov. 24 amounting to 5,726,000 tons, according to a cable received by *Coal Age*, as compared with 5,574,000 tons the previous week, a gain of 152,000 tons. Output for the corresponding week of last year was 5,471,800 tons.

The Welsh market is much steadier and all the principal operators report having sold their output to the middle of December. Inquiry is steady, but rough weather is delaying shipping. Operators are well pleased over the outlook for December and the early part of January.

French demand is more active but from the rest of Europe inquiry is spasmodic, with Germany buying meagrely. A normal demand is coming from Italy, with a stimulated inquiry from backward shipment. It has been announced that the credits for the purchase of British coal on German account have been partially arranged.

The Newcastle market is strong, the steam coals being materially stiffened by a contract from the German State Railways for 400,000 tons; as a result of the financial credit which has been arranged in London. Shipments are heavy; all sections of Durham coals are active and coking grades are in full demand.

Hampton Roads Receipts Decline

Receipts of coal at Hampton Roads were slower last week owing to the continued strike on the Virginian Ry., resulting in a somewhat upset market. Prices stiffened in consequence.

Coastwise business picked up somewhat, bunkers held their own and foreign trade continued on the downgrade. The prospect for better coastwise trade was brighter, although bunker business was not expected to show material improvement. It is expected that when grain movement becomes active bunker business will show much improvement.

Domestic prices slumped twice, from $12.50 to $10, while anthracite prices were forced down to $16, unusually favorable weather and slackened demand causing prices to decline.

French Coal Market Dull

Conditions in the French industrial coal market are dull due to less activity in plants and heavy unfilled orders. There has been a slightly better movement of house coals however. Announcement has been made that prices for the various grades are to be raised in the northern coal fields, the increases ranging from 5 fr. to 10 fr. and are to be applied according to mine up to Jan. 15.

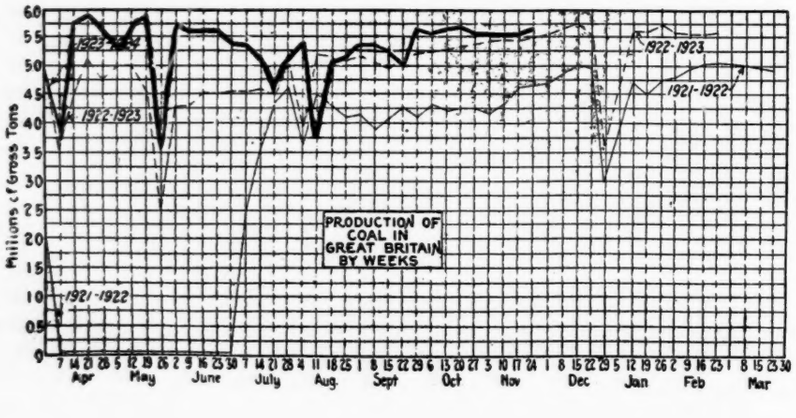
The coke situation is improving. During the first twenty-one days of November receipts amounted to 139,000 tons. It is expected that the price for French coke will be increased 10 fr. and a similar increase will be made for German product. It is also expected that Belgian grades will be increased 2.50 fr.

France and Luxemburg during the first ten days of November received 71,900 tons of reparation coal; 98,900 tons of coke and 10,800 tons of lignite. a total of 181,600 tons, as compared with a total of 148,500 tons during the last ten days of October.

Imports of coal during October amounted to 1,935,821 metric tons as compared with 2,619,831 tons in September, while exports were 121,915 tons in October, as compared with 156,137 tons in the previous month. Coke imported was 282,806 metric tons, as compared with 280,516 tons in September and 44,082 tons was exported in October, as compared with 50,944 tons in September.

Hungary's Coal Production

The mines of Hungary produced 1,724,895 metric tons of coal during the second three months of 1923, as compared with 2,082,626 tons the first quarter of the year, making the total production for the six months 3,807,521 tons, says Vice Consul Reineck, of Budapest, in a report to the Department of Commerce at Washington. The decline in production during the second quarter was caused by a reduction in working hours, many strikes the result of wage disputes, and miners returning to their homes in Czechoslovakia when the operators abandoned the practice of paying part of their wages in Czechoslovak currency. Some progress has been made in the mining industry; two new mines have been opened, and the larger operators have completed surveys for the purpose of extending their workings. Two of the larger operators the report says, have purchased and installed new equipment and begun work on a larger scale. During the first half of 1923 Hungary imported 38,242 metric tons of lignite, 424,550 tons of bituminous coal; 69,319 tons of coke and 1,549 tons of briquets, while its exports were 6,344 metric tons of lignite; 120,799 tons of bituminous coal and 2,741 tons of coke.



Export Clearances, Week Ended Dec. 8, 1923

FROM BALTIMORE

	Tons
For France:	
Fr. SS. Wesseling	6,896
For Porto Rico:	
Am. SS. Delfina	3,145
For Cuba:	
Am. Schr. Victoria S.	1,077

FROM HAMPTON ROADS

For Cuba:	
Br. SS. Berwindvale, for Havana	7,721
Amer. Schr. George W. Truitt, Jr., for Media Luna	1,090
For Africa:	
Amer. SS. West Kedron, for Dakar	6,452
For British West Indies:	
Amer. Schr. Georgette, for Georgetown	1,266

Hampton Roads Pier Situation

N. & W. piers, Lamberts Pt.:	Nov. 28	Dec. 6
Cars on hand	1,706	1,581
Tons on hand	100,622	92,373
Tons dumped for week	116,322	123,709
Tonnage waiting	9,250	15,375
Virginia Ry. piers, Sewalls Pt.:		
Cars on hand	667	1,246
Tons on hand	41,550	71,850
Tons dumped for week	40,422	31,924
Tonnage waiting	2,300	.....
C. & O. piers, Newport News:		
Cars on hand	1,217	1,316
Tons on hand	67,290	67,458
Tons dumped for week	100,907	119,640
Tonnage waiting	17,152	5,950

Pier and Bunker Prices, Gross Tons

PIERS

	Dec. 1	Dec. 8†
Pool 9, New York	$4.90@$5.25	**$5.00@$5.25**
Pool 10, New York	4.75@5.00	**4.75@5.00**
Pool 11, New York	4.40@4.75	**4.50@4.75**
Pool 9, Philadelpnia	4.85@5.10	**4.90@5.20**
Pool 10, Philadelphia	4.00@4.65	**4.50@4.90**
Pool 11, Philadelphia	3.95@4.00	**4.25@4.60**
Pool 1, Hamp. Roads	4.50@4.60	**4.60@4.75**
Pools 5-6-7 Hamp. Rds	4.15@4.35	*4.15@4.30*
Pool 2, Hamp. Roads	4.25@4.35	**4.25@4.40**

BUNKERS

Pool 9, New York	5.20@5.55	**5.30@5.55**
Pool 10, New York	5.05@5.30	5.05@5.30
Pool 11, New York	4.70@5.05	**4.80@5.05**
Pool 9, Philadelphia	5.10@5.50	**5.15@5.55**
Pool 10, Philadelphia	4.65@5.00	**4.90@5.25**
Pool 11, Philadelphia	4.30@4.55	**4.65@4.90**
Pool 1, Hamp. Roads	4.50@4.60	**4.60@4.75**
Pool 2, Hamp. Roads	4.25@4.35	**4.25@4.40**

Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations, by Cable to *Coal Age*

	Dec. 1	Dec. 8†
Admiralty, large	28s.6d.	**29s.6d.@30s.**
Steam smalls	19s.@20s.	**20s.@22s.**
Newcastle:		
Best steams	26s.	**24s.6d.@26s.6d.**
Best gas	24s.@24s.6d.	**23s.6d.@24s.**
Best bunkers	24s.@25s.6d.	*22s.6d.@24s.6d.*

† Advances over previous week shown in **heavy type**, declines in *italics*.

Traffic News

To Probe Lignite Rate "Plot"

President Coolidge has directed the Interstate Commerce Commission to make an investigation into what appears to Governor R. A. Nestos to be a conspiracy to destroy the coal mining industry of North Dakota by increasing the freight rates on lignite. This action was taken following the receipt of a telegram by the President from Governor Nestos asking for a Congressional inquiry into the proposed advance, which he says, if granted, would virtually destroy the industry.

Governor Nestos has been joined in his request for an investigation by U. S. Senator Shipstead, of Minnesota, who wrote the Interstate Commerce Commission stating that the proposed rates are confiscatory and will throw thousands of laborers out of employment. He adds that the rates are of such a character that they will prevent the movement of lignite and thereby favor Eastern coals.

Governor Nestos' appeal to President Coolidge supplemented instructions to the State Attorney General to investigate to determine if sufficient evidence of conspiracy to violate the Sherman Anti-Trust law has been obtained to be laid before the federal Grand Jury. The railroads have declined to abandon their petition for rate increases and, in response to the protest, the traffic manager of one Northwestern railroad declared that the proposed advance was made on demand of "our connecting lines." Rates temporarily suspended by the Interstate Commerce Commission, pending a hearing.

Soo Coal Traffic Still Heavy

During November 1,918,249 net tons of bituminous coal passed through the Canals Sault Ste. Marie, as compared with 2,031,084 tons in the preceding month. Of this amount 1,902,506 tons went through the United States Canal and 15,743 tons through the Canadian Canal. Anthracite handled amounted to 238,800 net tons, compared with 200,600 tons the previous month. The tonnage passing through the United States Canal was 230,250 tons, the balance going through the Canadian waterway.

Seek Rate on Topographic Basis

George T. Bell, attorney for the Southern Wyoming Coal Operators' Association, on behalf of the Rock Springs-Kemmerer district, has submitted a brief to the Interstate Commerce Commission in connection with the complaint of the Colorado and New Mexico Coal Operators' Association against the Denver & Rio Grande Ry. in which he contends that the Rock Springs-Kemmerer operators "are entitled to an adjustment of rates predicated on a parity between Rock Springs-Kemmerer and Walsenburg because the topographical, operating and traffic conditions are much more favorable in and from the southern Wyoming districts than in and from the complainant districts. They reasonably may be permitted to retain such an adjustment where they have it on the ground of competitive condition and on the broader and higher ground of public interest," he says.

Lehigh Valley Loadings

During November the Lehigh Valley R.R. loaded 1,030,067 tons of anthracite as compared with 1,124,502 tons in the corresponding month of last year. Officials of the Hazleton and Mahoney divisions of the railroad report that during the week ended Nov. 29 204,340 tons of hard coal were sent to market over those branches.

Protests Some New Indiana Rates

The Indiana Public Service Commission has announced a tentative schedule of coal rates for Indiana groups of cities in which it is revealed that the rate for Logansport has been increased ½c., to $1.69. The State Chamber of Commerce protests the rate from Logansport, Delphi and Monticello as well as that for Lebanon, Lafayette and Frankfort, its committee having proposed that the rate for Logansport, Delphi and Monticello be reduced to $1.50 and that the Frankfort, Lebanon and Lafayette rate be placed at $1.50. The commission has announced the latter rate as $1.45.

Oppose Removal of Through Rate

There has been a through rate on hard coal from the mines to the Twin Cities of $6.56 which the roads recently sought to withdraw, effective Jan. 1. This would leave the rate the sum of the locals, an increase of $1.66. The proposed withdrawal is being vigorously opposed by the independent retailers of the Twin Cities, who see in the move a step to force them to buy hard coal from the docks only. They suspect that it presages a further advance in the price of hard coal. The withdrawal probably will be suspended, pending a hearing on it.

G. & E. Rates Unreasonable

In an order which becomes effective Feb. 29 next, the Interstate Commerce Commission finds that rates on coal in carloads from mines on the Greenbrier & Eastern R.R. to interstate destinations are unreasonable. The order was issued upon the complaint of the Nelson Fuel Co. and others against the Chesapeake & Ohio Ry. and other carriers The Commission also held that the rates are unreasonable to the extent that they exceed or may exceed the group rates contemporaneously maintained from branch-line points on the Chesapeake & Ohio Ry. in the New River district in West Virginia to the same destinations.

Recent Patents

Mine-Car Coupler. P. J. Elliott and E. L. Bonamy, Newcastle, Wash.; 1,469,434. Oct. 2, 1923. Filed June 17, 1922; serial No. 569,174.

Cutting Link for Coal-Cutting Chains. C. N. Barton, Indianapolis, Ind.; 1,469,576. Oct. 2, 1923. Filed Dec. 15, 1919; serial No. 344,841.

Safety Holder for Mine Squibs and Detonators. J. W. Davis, Ansted, W. Va.; 1,470,150. Oct. 9, 1923. Filed Feb. 10, 1922; serial No. 535,644.

Mining Machine. Morris P. Holmes, Claremont, N. H., assignor to Sullivan Machinery Co., Chicago, Ill.; 1,470,571. Oct. 9, 1923. Filed March 28, 1918; serial No. 225,342. Renewed April 14, 1922; serial No. 552,593.

Cutter Chain for Mining Machines. T. E. Pray, Chicago, Ill., assignor to Goodman Mfg. Co., Chicago, Ill.; 1,472,736. Oct. 30, 1923. Filed Dec. 16, 1920; serial No. 431,250.

Method and Means for Handling Cars in Mines. Marion Stufflebeam, St. David, Ill.; 1,472,696. Oct. 30, 1923. Filed April 19, 1923; serial No. 633,202.

Association Activities

At a meeting of the **Northeast Kentucky Coal Association** held recently at Ashland, Ky., a report was received from the State Workmen's Compensation Board announcing an increase in the base rate from $3.40 to $3.75 and the minimum rate from $2.50 to $2.85, a flat increase of 35c. per $100 payroll. The increase was made notwithstanding a protest filed with the board by every association in Kentucky. The annual meeting of the association will take place Jan. 24 at the Ventura Hotel, in Ashland. A special committee was appointed by President Connor to arrange for the annual gathering, when important problems confronting the industry will be considered.

The fourteenth annual meeting of the **Smokeless Coal Operators' Association of West Virginia** is being held at Washington today. Officers are to be elected and a board of directors chosen for the new year. United States Senator David A. Reed has accepted an invitation to make an address at the luncheon following the business meeting.

Holding their semi-annual meeting during the first week of December, members of the **Huntington Coal Exchange** elected T. M. Hooper as president to succeed I. F. Vass, who has led the exchange since its organization. Roy H. Cunningham, of the Tri-State Fuel Co., was elected vice president. Other officers will be elected at the annual meeting in May. The new president is a member of the Hooper-Mankin Fuel Co., of Huntington. There were about twenty-five members in attendance at the meeting. In addition to electing officers, members gave their attention to questions of policy and discussed general coal conditions.

Coming Meetings

Coal Mining Institute of America will hold its annual meeting Dec. 19, 20 and 21 at Pittsburgh, Pa. Secretary, H. D. Mason, Jr., Chamber of Commerce Building, Pittsburgh, Pa.

Tug River Coal Operators' Association. Annual meeting Jan. 4, 1924, Bluefield, W. Va. Secretary, C. C. Morfit, Welch, W. Va.

New England Wholesale Coal Association. Annual meeting Jan. 8, 1924. Boston, Mass. Secretary, R. S. Townsend, Boston, Mass.

Engineers' Society of Western Pennsylvania. Annual meeting Jan. 15, 1924, Blue Room, William Penn Hotel, Pittsburgh, Pa. Secretary, K. F. Treschow, Pittsburgh, Pa.

American Wood Preservers' Association. Annual meeting Jan. 15-17, 1924, Hotel Buehlebach, Kansas City, Mo. Secretary, P. R. Hicks, Chicago, Ill.

Northeast Kentucky Coal Association. Annual meeting Jan. 24, 1924, Ashland, Ky. Secretary, C. J. Neekamp, Ashland, Ky.

News Items From Field and Trade

ALABAMA

The Thomas & Weller Mining Co., of Birmingham, has leased coal mines at Aldrich, and will use 150 convicts in operating them.

The Bryan Coal Corporation has sold 10,000 acres of coal lands in Walker and Jefferson counties to Walter Moore, president of the Pratt Fuel Corporation, and associates, who will operate present mines and contemplate further development.

ARKANSAS

At the recent convention held at Fort Smith, of District 21, U. M. W. of A., the delegates amended its constitution to **debar from membership any mine worker holding membership in the K. K. K.**

The Coronado Coal Co. on Dec. 4 appealed to the U. S. Circuit Court of Appeals **from the decision of Federal Judge Pollock,** Oct. 27 last, directing a verdict for the defendants in a retrial of the company's suit against the United Mine Workers for $2,222,000 for alleged damages to property in the 1914 coal miners' strike. The appeal was filed for C. H. Finley, receiver for the company, with a request that the case be advanced on the docket. In support of the motion it was contended that the decision, if allowed to stand on the records, would encourage organized labor, including the mine workers, to destroy property in strikes. The United Mine Workers filed an answer opposing the motion to advance the case on the docket, declaring it was of no more public interest than others on the docket, and that Judge Pollock's decision merely put into effect previous decisions of the U. S. Supreme Court interpretative of the Sherman Anti-Trust act.

ILLINOIS

Preparations for opening up the Empire mine of the Illinois Coal & Coke Co., near the state fair grounds, which has been closed since April 1 are being made. About 375 men are employed at the shaft. Orders have been given to place mules in the mine and begin work of cleaning up. Officials of the mine did not say at what time operation will be resumed.

George A. Wilson, of Sparta, is sinking a new shaft a short distance southwest of the junction of the Mobile & Ohio and Missouri & Illinois railroads there. The old shaft of the Boyd Coal & Coke Co.s mine will be abandoned. The new mine is the cause of litigation, resulting in a suit for $100,000 against the Missouri & Illinois R.R., which constructed a dam creating a pond covering more than thirty acres. This may eventually wipe out a summer resort at a lake nearby, and, it is alleged, will endanger miners at work in the new mine which will extend under the pond.

After two months idleness, on account of labor troubles, the **Brewerton Coal Co. at Lincoln, will reopen its shaft.** Trouble over the check-weighman's scale caused the men to quit work Sept. 26.

The Illinois Department of Mines and Minerals is disturbed by politics. Since the resignation of Robert M. Medill as director, members of the staff have been uneasy because some asserted that Governor Len Small expected them to work for his re-election. Richard Neeson, a special investigator, has already resigned.

Announcement of an **expenditure of $500,000 by the Leland Coal Co.**, of St. Louis, on its ten or more mines in Illinois has been made. The company owns mines at Tuxhorn, Shelbyville, Auburn, Athens and Girard, besides five others in Sangamon County. The amount will be spent in various improvements at the mines.

A. J. Moorshead, president of the Madison Coal Corporation, of Chicago, is spending the month of December cruising along the California and western Mexican coast in the private yacht of his son, Oliver Moorshead, of Los Angeles. Mr. Moorshead probably will be back in Chicago about Jan. 7.

INDIANA

One of the first bills to be introduced in Congress will be one by Representative Everett Sanders **providing for a federal mine-rescue station in Terre Haute, Ind.** The recent disaster in the Hunt mine at Staunton, in which four lives were lost, is proving to be one of the chief points to spur those interested in the coal mines into greater activity. The entire northern region of the Indiana bituminous fields has its center in Terre Haute and the nearest federal aid is the truck station at Vincennes. Phil Penna, secretary of the Indiana Bituminous Coal Operators' Association; John Hessler, president, and William Mitch, secretary of District 11, United Mine Workers, have expressed the sentiments of their organinzations as favoring the station.

The Joan Coal Mining Co., capital $75,000, has been incorporated at Riley by George G. Rowland, David Rowland and Louis Clements.

An order naming Frank C. Gore, attorney, receiver for the Key Coal Co., was set aside in probate court at Evansville recently on motion of the Consumers' Coal Co. of Indianapolis. Gore was appointed receiver for the company on petition of Martin Emig, Jr., who alleged that the Key Coal Co. owed him $200. The Consumers' Coal Co. asked that the order be set aside on the ground that it had filed a receivership petition four days before. According to attorneys in the case, the Key Coal Co. has issued and sold $80,000 worth of securities with the approval of the Indiana Securities Commission.

Indiana's major coal mines produced 25,363,388 tons during the fiscal year ended Sept. 30, 1923, which was 10,413,998 tons more than was mined the previous year and which came within 3,432,294 tons of the peak production during the war, according to Cairy Littlejohn, chief inspector of the State Department of Mines and Mining. The wage paid to 31,189 miners in the major mines amounted to $45,920,877.54, said Mr. Littlejohn. The average wage was $1,472.32 a year. There were seventy-five fatal accidents and 6,528 other accidents during the year, with no large mine disasters. The miners of Indiana were idle 9,359 days because of overproduction, 7,814 days through shortage of cars, 459 days on strikes and 2,736 days for other reasons.

KENTUCKY

Brent Hart of the Hart Coal Corporation, Madisonville, **has offered a reward of $1,000;** Governor Morrow, for the State of Kentucky, $500; and business men of Madisonville and western Kentucky, $800, making **a total of $2,300 for arrest and conviction** of those dynamiting the home of Lee Row and Dewey Williams, non-union miners, employed by the Hart Coal Corporation. The explosion occurred in late November, but no one was injured. It followed threatening notes and placing of bundles of switches on the door steps of the house.

Hazard reports that the **Himya Coal Co.**, at Domino, and numerous mines on First Creek, Lotts Creek, Carrs Fork, and around through the Hazard Field have closed and thrown many miners out of work.

The first coal coming into Louisville by water in several weeks arrived on Dec. 6, when as a result of rains and higher boating stages, the **towboat J. F. Butts came in from the Kentucky River with six barges of eastern Kentucky coal.**

An effort will be made at the January session of the State Legislature to establish a **state constabulatory,** which would be of considerable value in handling riots and labor troubles. Union labor is expected to fight the effort.

A flood of coal taxing, coal regulating and labor bills is expected before the meeting of the Legislature in January. At the last session an appropriation of $30,000 was made for investigating the coal situation and the taxation situation.

It is reported that Birmingham (Ala.) interests are behind the **Morrison Coal Co., which is planning a stripping operation** at Centertown, which will have a capacity of 5,000 tons daily. There are now some nine plants which are operating and which have capacities ranging from ten to forty cars a day, with one reported to have a capacity of eighty cars or more a day. Several additional plants are getting ready to operate.

Henry E. James, Kentucky State Inspector and Examiner, in his biennial report on the Department of Mines, Lexington, **reiterates that the appropriation is far from adequate** for the work. This appropriation is but $23,800 to cover salaries and travelling expenses for nine men, including a chief and eight inspectors, and for inspection of 650 or more mines each three times a year.

NEW YORK

The Independent Coal Corporation of New York City, has been appointed agent at New York for the Naples Coaling Co., Naples, Italy, in connection with the supply of bunker coal to steamers at that port. Arrangements have also been completed whereby the corporation will represent the British Coal Bunkering Co., of Gibraltar.

PENNSYLVANIA

Negotiations are reported to be under way **to purchase of coal underlying the Holy Cross Church,** one of the largest in Scranton, from the Glen Alden Coal Co. The coal will cost the congregation approximately $6,000. Thirty-five cents a ton is the figure upon which this is based, the Scranton school district having purchased coal under several of the schools at this price.

The Park Hill Coal Co., which was recently incorporated at Harrisburg, operates a slope with surface vein mining in the West Scranton residential section. Operations were started about a year ago. About 100 tons a day is the capacity of the operation.

Men experienced enough to go into the mines and cut coal are exceedingly scarce in the Wilkes-Barre region, according to statements made by several of the big producers. The operators assert that while there is more than enough common labor, men holding state mining certificates are unobtainable.

That the company has the right to prevent miners' committees from meeting on the company property; that if a committeeman or a committee calls a strike without first taking the issue before the proper body for adjudication of disputes, namely, the Conciliation Board, the company has the right to discharge the committeeman or the committee, as a whole, was the attitude announced by the Lehigh Coal & Navigation Co. at Lansford during the past week, following a strike at the Nesquehoning collieries.

Many grievances advanced by the miners' union were settled during the week at meetings arranged by the Anthracite Conciliation Board in Scranton, Shamokin and Hazleton. Only parts of the board were represented at the sessions and several of the meetings were held simultaneously in the different cities.

Assessment of culm banks for tax purposes is being made by the Scranton board of assessors this year for the first time in the history of the city. In the past the land on which the culm banks stood was merely assessed at a nominal value, equal to the figure placed against adjoining land. Next year the city will try to collect taxes on a valuation which includes both the worth of the land and the value represented by the reclaimable culm in the banks. On what basis the assessors are fixing the valuations was not made known.

To safeguard the lives of their employees and to facilitate the movement of supplies from one section of the operation to the other, the **Glen Alden Coal Co.**, of Scranton, **has constructed a 175 ft. concrete subway** under the roadbed of the D. L. & W. R.R. at the Baker colliery in Bellevue. A track for mine cars has been laid in the tunnel. In the past it was necessary for employees to cross three tracks on the Lackawanna to go from one section of the operation to the other and supplies had to be hauled over one-half mile by motor truck.

The Hillman Coal & Coke Co. has resumed operations at the Griffin No. 1 plant, which had been idle for about a month, firing half of the 200 ovens at that place; the Isabella plant, which also had been idle for about a month, is firing all of the 136 rectangular ovens and half of the 124 beehive ovens.

The Hustead Semans Coal & Coke Co. has fired 50 of its 195 ovens at the Hustead plant, near East Millsboro, which had been idle for over a month.

The Luzerne Coke Co., a subsidiary of the Hillman Coal & Coke Co., of Pittsburgh, on Dec. 1 **purchased the Orient plant of the American Coke Corporation** at a sheriff's sale of the property at Uniontown, for $45,000 cash and the assumption of the $850,000 mortgage held by the Luzerne Coke Co., making the total purchase price $895,000.00. The plant is located in Fayette County, between Uniontown and Brownsville, and consists of about 800 acres of unmined Pittsburgh vein coal, hoisting and airshafts about 200 ft. deep, with modern steel tipple and equipment, and 480 beehive ovens, all thoroughly equipped. The plant has been idle for the past two or three months.

G. W. Esslinger, for the past twenty-two years chief engineer for the L. & W. V. R.R. Co., **has purchased the controlling interest in the Spencer Coal Co.**, at Dunmore, and will take over full charge of the mine. The Spencer mine has a daily output of between 200 and 300 tons of coal and employs about 200 men. For the past three months the employees have been on strike but it is expected that the taking over by Mr. Esslinger will result in a settlement with the men and that they will return to work soon.

Coleman & Co., Inc., bituminous-coal producers, announce the removal of their offices, Dec. 1, to Banker's Trust Building, N. E. Corner Juniper and Walnut Streets, Philadelphia.

Announcement has been made by the General Committee of anthracite operators that an **"anthracite economy show"** is to be opened in Philadelphia and maintained on a "more or less permanent basis." The show was organized by the committee, it was stated, acting in co-operation with the makers of apparatus for burning the smaller sizes of anthracite. Nine or ten manufacturers of such equipment will exhibit. Information for all anthracite users will be available, it was announced, experts representing the manufacturers being reinforced by fuel engineers connected with the producing companies.

Coal must be sold by the weight and not by the load in Hazleton, according to an opinion from the State Department at Harrisburg. City Inspector of Weights and Measures James P. Lamont, of Hazleton, found coal being sold by the wagon load in some parts of that city.

West Nanticoke Coal Co., through its president and secretary, A. D. W. Smith and Carl B. Metzger, has filed a petition with the Luzerne County Court, **asking for a dissolution** of its charter. A hearing will take place December 31.

Rinaldo Cappellini, president of District No. 1, United Mine Workers, has been **elected delegate to the international convention** of the United Mine Workers of America in Indianapolis, Ind., in January, to represent the No. 6 colliery local of the Pennsylvania Coal Co. The district president is a member of the local.

Considerable business is coming to central Pennsylvania coal operators, notably in the Broad Top region and in Somerset County, by **making bituminous coal available as a substitute for anthracite.** Operators are installing breakers and screens to prepare the coal in suitable sizes, corresponding to the sizes of anthracite. In Somerset County, the E. E. Sheets Coal Co. has purchased the coal property a short distance southwest of Somerset, for many years operated by Wesley J. Barron and later by his son Ira Barron. Recently a deposit of cannel coal was opened up on the property and it has since gained such strong favor in the markets of the East that the entire output has been contracted for by a Baltimore dealer. Local consumers of the fuel are using the smaller sizes which result from breaking and screening, being unable to secure a supply of the larger sizes by reason of the contract with the Eastern dealer.

The U. S. District Court at Philadelphia in a decree signed by Circuit Judge Davis Dec. 4 appointed the **Wilmington Trust Co.**, Wilmington, Del., as **trustee of the stock of the new coal company** which is to be organized as part of the plan for the dissolution of the Reading Company and its underlying subsidiaries, under orders of the U. S. Supreme Court. At the same time counsel for the Reading companies revealed that the new corporation is to be organized under the laws of Delaware and will be known as the **Philadelphia & Reading Coal & Iron Corporation.** A warrant showing the right of stockholders to subscribe to certificates of interest in shares of no par value of the proposed new Philadelphia & Reading Coal & Iron Corporation, will be delivered on Jan. 10 to stockholders of the Reading company, Jay V. Hare, secretary of that company, announced Dec. 6. The warrants are to be issued to shareholders of record at the close of business Dec. 17. This procedure was ordered in a resolution adopted by the Board of Diretcors.

William H. Patton resigned Nov. 30 as district sales engineer, in charge of the Pittsburgh office of the Ironton Engine Co., with which he had been connected for the past five years and eight months.

TENNESSEE

An early morning fire Nov. 14 destroyed the commissary store of the Fork Ridge Coal & Coke Co., Fork Ridge, Delsea, just south of Middlesboro, Ky., resulting in a loss estimated at $50,000. Lack of wind made it comparatively easy to prevent spreading of the fire and loss of the town. Two residence buildings were burned.

VIRGINIA

Hugo Stinnes, Jr., son of the German industrial king, was in Norfolk recently in company with T. J. Licklider, manager of the Norfolk office of the Lake & Export Coal Co., agents for the Stinnes ships. Stinnes came from Charleston, W. Va., where he inspected coal operations, and looked over the coal-handling facilities at Norfolk. Mr. Licklider said Stinnes was following coal from its source to tidewater to study methods used in handling it. He went from Norfolk to Baltimore to watch the operation of piers there.

The Board of Directors of the Virginia Iron, Coal & Coke Co. on Nov. 22, declared a dividend of 2½ per cent on the preferred stock, and a dividend of 1¼ per cent on the common stock, payable Jan. 2, 1924, to stockholders of record at the close of business Dec. 15.

WASHINGTON

The twenty-eighth winter mining session of the College of Mines, University of Washington, will be held at Seattle from Jan. 4 to March 20, 1924. The courses are open without examination to anyone interested in mining. Expenses consist of the cost of materials actually used and a university fee of $20. The studies are arranged in four groups: quartz mining, placer mining, coal mining and ceramics.

WEST VIRGINIA

President J. B. Clifton, of the Raleigh Smokeless Fuel Co. and of several other large operating companies in the Winding Gulf field, with headquarters at Beckley, sailed Dec. 6 on the ship "Southern Cross" for South America to visit the company's agency at Rio Janerio and other points in South America. He expects to be away for several weeks.

One of **a series of meetings of mine inspectors** to be held was concluded on Dec. 5 in the office of R. M. Lambie, chief of the state Bureau of Mines, at Charleston. Problems confronting the West Virginia inspectors and methods with which to meet them were discussed. Other meetings will be held at Fairmont and Welch. A two-day examination for foremen and firebosses of this district, in which seventy-two candidates had entered, also ended the same day.

The Gage Coal & Coke Co., operating at Junior, Barbour County, is engaged in constructing a river conveyor which will enable the company to dump coal on both sides of the Tugarts Valley River.

The D. T. S. Coal Co. has increased its capital stock from $100,000 to $250,000; the **Holly Elk Coal Co.** from $200,000 to $350,000; **Pinnacle Coal & Coke Co.** from $500,000 to $750,000; **Middle Fork Block Coal Co.** from $150,000 to $200,000. The capital stock of the Elk Ridge Coal & Coke Co. has been reduced from $75,000 to $25,000.

There were ten new coal companies launched in the state during October, eight of them resident and two of them non-resident coal corporations, with an aggregate capital stock of $4,750,000. The largest was the Mansfield Coal Corporation, of New York City, having an authorized capital stock of $3,500,000. Other companies organized included the Columbus Pocahontas Coal Co. (non-resident) of Columbus, capitalized at $500,000; Cap Smokeless Fuel Co., Charleston, $75,000; Wheeling-Glenwood Coal Co., Wheeling, $50,000; Jaunds Mining Co., Charleston, $130,000; Royal Pocahontas Coal Co., Iaeger, $20,000; Cagey Coal & Coke Co., Fairmont, $25,000; Bellis Coal Co., Buckhannon, $25,000; La-Go Pocahontas Coal Co., Iaeger, $100,000, and Gilbraltar Coal Co., Charleston, $325,000.

A suit instituted in the Circuit Court of Marion County by S. A. Scott, an operator of Fairmont, against W. W. Brewer, Ed Baker, Bruce Davis, Ervid Right and H. H. Harrison, partners trading as the Stone Lick Coal Co., involves approximately $300,000, the largest amount of money in litigation in Marion County in several years. The plaintiff claims breach of contract on the part of Brewer and his associates in not permitting Scott and his employees to operate a tract of coal of about 600 acres in the Lewis County field under the terms of a contract in existence. The plaintiff bases the amount involved in the suit on the profits which he claims could be made on the tonnage mined from the tract. Another action has been brought by C. W. Brandon against Brewer and his associates, in the sum of $10,000, Brandon claiming that he carried on the negotiations which would have permitted Scott to mine coal from the Lewis County tract.

WISCONSIN

Low water in Lake Michigan is troubling coal men because large carriers are unable to load to capacity and reach docks at receiving ports. This is particularly true of Milwaukee. The leading dock companies of that port have petitioned the municipal authorties to provide increased funds for dredging harbor channels.

Four steel steamers belonging to the Cleveland Cliffs Iron Co. are being equipped with self-unloading machinery at Sturgeon Bay. It is designed to use the vessels in delivering coal to ports on the upper lakes where docks have no unloading bridges.

CANADA

At the annual meeting of the United Boards of Trade and Chambers of Commerce of Western Ontario at St. Thomas, on Nov. 29 a resolution was adopted urging the Dominion and Provincial governments, the Canadian railways and all others concerned to endeavor to make it economically possible for the people of Ontario to use Alberta coal, to prevent the recurrence of the shortage experienced during previous winters.

Overproduction is given by H. B. Gillis, superintendent, as the cause for the suspension of operations at the Bell Island mines of the British Empire Steel Corporation. The mines closed on Nov. 30, about 1,000 men being thrown out of employment. Only sufficient help will be kept on to keep the mines pumped and the power house in readiness for resumption of operations, which it is hoped will be about the middle of January.

One of the outstanding events of a week ago from the viewpoint of coal-mine operators and employees was the **announcement in the budget speech** of John Hart, Minister of Finance, to the Legislative Assembly of British Columbia, that **a tax of one half cent a gallon would be placed on foreign fuel oil** consumed in that province. This is a policy that has long been advocated by William Sloan, Minister of Mines, who represents the coal mining town of Nanaimo, Vancouver Island, in the Legislature.

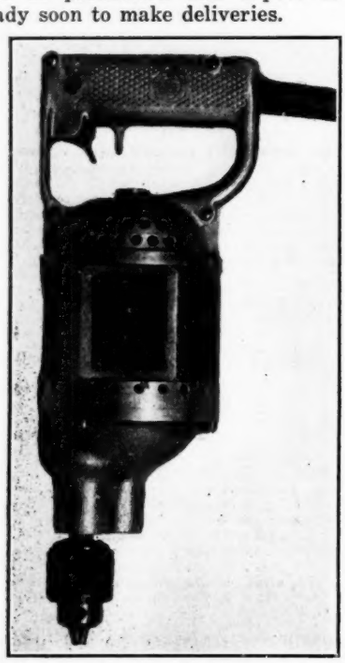
Over three million tons of coal was produced by the Dominion Coal Co. during the eleven months ended Nov. 30, according to figures obtained last night. The output for November was 205,658 tons, which is the smallest month's tonnage since April, 1922, when a strike on the job policy resulted in curtailing the monthly output to 162,085 tons. The actual figures for the first eleven months of this year are 3,071,159 tons, compared with 2,558,293 tons for the same period in 1922, an increase in 1923 of over half a million tons. The November output is some 88,434 tons less than the October tonnage and 111,212 tons less than that for November, 1922.

New Equipment

New 5/16-Inch Portable Electric Drill

This portable electric drill with a capacity up to $\frac{5}{16}$ in. in steel is quite similar to the $\frac{1}{4}$ in. drill, but has a much more powerful motor and other parts in proportion to its size. It is equipped with a three-jaw gear nut chuck for straight-shank drill bits. It weighs 7 lb. and has a no-load speed of 1,400 revolutions per minute. It is equipped with the well-known pistol grip and trigger switch.

The Black & Decker Co., Towson Heights, Baltimore, Md., now have this tool in production and expect to be ready soon to make deliveries.



NEW PORTABLE ELECTRIC DRILL

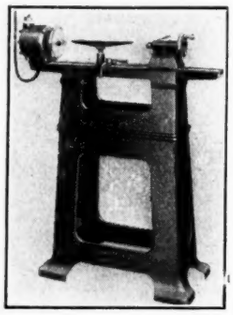
Drilling the work on the job instead of carrying the work to a drill press is possible on many jobs where this drill is supplied.

Single-Speed Bench Lathe

A new single-speed portable 6-in. bench lathe has been placed on the market by J. D. Wallace & Co. This machine, which probably is the smallest electrically driven woodworking lathe made, is designed to do the smaller turning operations which make up a great share of the work in many woodworking plants.

This little lathe is intended for work up to 6 in. in diameter. It clears 5 in. over the tool rest and 7 in. on the faceplate, with full 24 in. between centers, and runs at 3,400 r.p.m. The machine weighs but 203 lb. and at the same time it is heavy enough to stand rigidly without vibration. Its height over all is 46 in. and length over all 40 in. The sub-base is open, so that it serves as a convenient holder for tools.

A $\frac{1}{3}$-hp. ball-bearing motor is built into the headstock and is entirely enclosed, making it dustproof. It is



MOTOR-DRIVEN BENCH LATHE

This little bench lathe is designed for work up to 6-in. diameter and is supplied complete with electric motor drive.

direct-connected to the lathe spindle and provides ample power for cutting up to the limit of the lathe. It is controlled by a conveniently located switch, and as there are no belts to shift, the safety element is well taken care of.

Double Drum Hoist for Slushing

The tremendous increase in demand for metals, coal and other products of the mine has caused the application of mechanical methods to one mining operation after another during the last half century. The drilling of the rock and its transportation are now done in several efficient mechanical ways but the handling and loading of the material broken in the underground workings is still almost universally being done by hand.

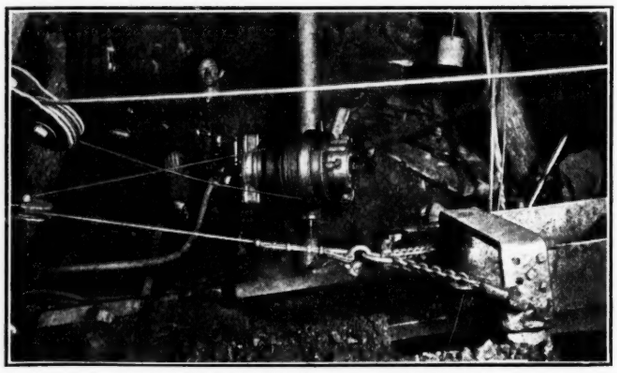
The inefficiency of the hand shovel and the increasing scarcity of the class of laborers required for the work have led to the development of a number of loading and shoveling machines, many of which are successful in the class of work for which they are designed and adapted. Machines of this class now on the market are practically all large, heavy and of high capacity. They require the services of operators of a higher grade of mechanical intelligence than is common among ordinary mine labor. In addition to high first cost, many of them frequently require expensive and time-wasting repairs. Furthermore, their size, weight and capacity limit their adaptability to utilization in the larger openings and most accessible places.

An excellent solution to the problem lies in the use of the 6-H "Little Tugger" air hoist with a scraper. The method is called "slushing." The use of scrapers in mining merely involves the application of the several arrangements that have long been widely used in surface operations, varying from the horse-drawn slip scraper, or "slusher," seen on every small grading job to the various dragline scrapers and graders used in ditching, grading and other large excavation work.

The 6-H "Little Tugger" hoist is small enough to work in narrow drifts or crosscuts and under very low heading. It is sufficiently powerful to load any muckpile. It is simple enough to trust to an unskilled workman. It is so rugged that it will continually stay on the job without needing any expensive time-wasting repairs.

The small size, portability and ease of mounting the "Little Tugger," allows it to be quickly moved. As it can be set up almost anywhere—it can be clamped to a column, bolted to a timber or mounted on a truck in a few minutes' time—it usually is unnecessary to make any rearrangement of chutes, crosscuts or rooms to effect a marked saving in mucking and loading time and labor.

This hoist was specially designed for slushing, but there are many other jobs to which it can be successfully applied, such as balanced haulage in mines and strippings. The Ingersoll-Rand Co. are the manufacturers.



DOUBLE DRUM AIR HOIST

Within the next few years one of the greatest developments in coal mining probably will be in the application of labor-saving devices at and near the coal face. This little air hoist, being portable, can be used for scraping in many rooms.